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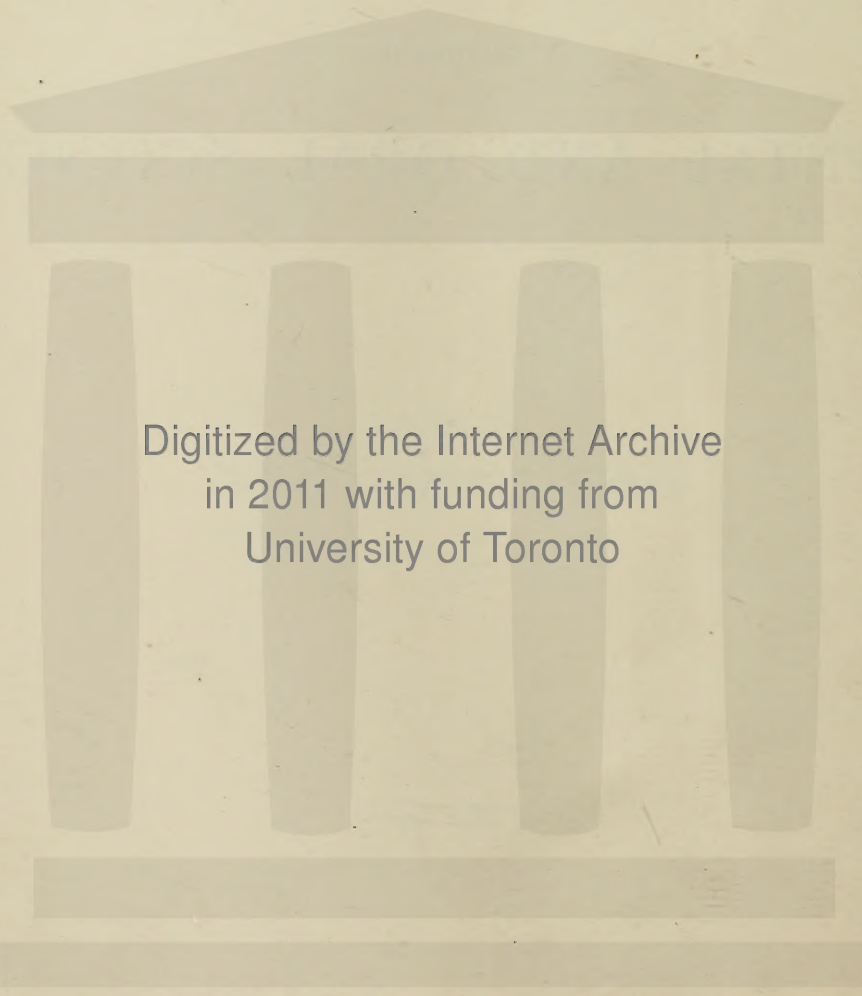
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Original Communications.¹

INSTRUMENTAL PRECISION IN DENTAL PRACTICE: A REVIEW OF SOME OF THE INVESTIGATIONS OF DR. G. V. BLACK.²

BY WILLIAM LEON ELLERBECK, D.D.S., PHILADELPHIA.

IN the May number of the *Dental Cosmos* for 1895 there appeared the beginning of an article by Dr. G. V. Black, entitled "An Investigation of the Physical Characteristics of the Human Teeth in Relation to their Diseases and Practical Dental Operations, together with the Physical Characters of Filling-Materials." The article extends through several issues of the *Cosmos*, some important conclusions appearing in the April number for 1896.

It is no exaggeration to say that it is one of the most extensive, one of the most interesting and highly instructive contributions bearing on dental science that has ever been produced, and, as remarked by Dr. Burchard, may properly be mentioned along with the discoveries of Dr. Miller relative to the causative influences of

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the Academy of Stomatology, November 26, 1900.

tooth-decay, and of the investigations of Dr. Cryer on the important subject of regional anatomy and its bearing on oral surgery. While, as mentioned, the contribution is highly scientific and decidedly interesting and instructive, it is, however, safe to say that the average dental practitioner has not found time to go very fully into the subject or follow out in detail the whole list of Professor Black's experiments, much less to take up the matter from a practical experimental stand-point, and attempt to verify, or disprove, or improve upon his results.

While it is hardly possible that there is any one here who has been unfortunate enough to have failed to read the article referred to, still there may be some of you who have read but have not seen put into practical operation any of the experiments or tests as performed by Dr. Black. If such there be, it will furnish me the excuse for accepting an invitation to give a partial review of this work, including by way of demonstration a few practical experiments as an argument that his conclusions are not wholly theoretical.

While it is impossible and, in fact, unnecessary at this time to go into the whole detail of his work, I do hope to give you in a general way a review of Dr. Black's experiments, together with some of the important deductions which have a practical bearing on dental practice. In order to acquaint the profession with the exact ground covered in his stupendous work, Dr. Black's article included of necessity much detail, and extended over such a long period of time, it may be that some have failed to properly relate one with the other the several features of his experiments.

First, it appears that his intentions were to determine for careful comparison the exact percentage composition as regards lime salts, organic matter, and water of the different teeth of different individuals of the same and different ages, and of the different teeth of the same individual, noting in every instance the apparent quality of the teeth as adjudged by clinical classification, known as hard, medium, or soft teeth, and also making note of the condition of the teeth at the time of their loss to the patient, whether the pulp was living or dead, whether the teeth had been lost through disease or otherwise, and whether carious or not, the idea throughout being to learn what influence, if any, differences in percentages of lime salts might have in determining the liability of the teeth to assume pathological conditions.

Secondly, but immediately connected with this division, are his experiments determining the hardness of tooth-structure, but more particularly as representing the bulk of the tooth, the elasticity and hardness of the dentine of the different teeth under the different conditions above referred to.

Thirdly, after determining the ability of the teeth under various conditions to withstand crushing stress, there was conducted a series of experiments to determine the force exerted in the closure of the jaws, the object of the experiment, of course, being to learn the amount of stress to which teeth under different circumstances would be subjected, this to be borne in mind in the preparation of cavities for the insertion of fillings, also to determine the strength requirements of the filling-materials to be used.

Fourth, a series of experiments was conducted to determine the effect of dehydrating tooth-structure, noting the difference in degree, if any, of the shrinkage produced in dentine and in enamel, and noting what effects might be produced which would have any influence on our treatment, as regards hot-air applications, in the preparation of teeth for filling.

Fifth, amalgam being extensively employed in tooth repair, an extensive series of experiments was conducted in relation to this material, the effort being to obtain as nearly as possible a product possessing such chemical and physical properties as would insure tooth preservation. Also in this connection were made many experiments to determine exact methods of preparing amalgam alloys, the best metals to be employed in the alloy, and the amount of each. Also, note was taken of the changes brought about by the influence of heat on the cut alloy, and the influence of different proportions of mercury employed to effect amalgamation, and the amount of stress required, and the best pluggers to be used in packing amalgam in order to get the best and uniform results, copper amalgam as a filling-material coming in for its share of attention.

Finally, an extensive series of experiments on gold as a filling-material was conducted, the influence of manipulation and preparation for particular purposes receiving considerable attention.

In regard to the instruments employed by Dr. Black in his experiments I have this to say as to their accuracy: There are four particular instruments used for different purposes in the experiments which register pounds avoirdupois. One is the phagodyna-

mometer, used in determining the force necessary to crush different food-stuffs. Another is the dynamometer, used to determine the crushing stress of blocks of dentine and of amalgam. Another is the mandudynamometer, used to determine the hand-force required in inserting amalgam fillings in order to obtain the best and uniform results; and still another is the tuptodynamometer, used in determining the force of blows required to properly condense gold fillings.

Now, the dynamometer registers on a dial the number of pounds applied on a double bow spring, which, when pressure is applied, moves a rod, which, in turn, moves a cog-wheel, which causes to revolve a hand over the dial-plate which registers the pounds. Some definite way was determined to insure accuracy in the projection of this scale. As to just the method employed I am not aware, but it is plain to see that by applying known weights to the spring and marking the registrations, the divisions could be accurately determined. Now, as to the mandudynamometer, the principle of its construction is somewhat on the principle of a weigh scale, only, instead of the weight register moving up and down, it moves in a plane back and forth. If, now, different weights were applied, and the movement of the arm noted, a scale could be easily projected. Similarly the scale of the tuptodynamometer and phagodynamometer were projected. If a flat-end plugger of known area is arranged on the dynamometer, and a piece of tough paper of definite thickness and texture is placed over the smooth surface of a piece of hard wood, the whole being placed so that the pressure of the point would come directly on the wood and paper, and the plane of the plugger be made parallel with the plane of the paper, it will be found that the same pressure is invariably required to make the plugger just puncture the paper and leave the paper disk buried in the wood so that its outside surface will be in the same plane as the surface of the wood. Now, if the same plugger be placed in each of the other instruments, and the same block of wood and paper be used, it can be shown that absolutely the same pressure as registered on the different instruments will be required to similarly effect the puncture.

My object in citing this example is, of course, to illustrate in a mild way the absolute accuracy of Professor Black's instruments. Throughout the whole range of experiments conducted, the chemical analysis, the methods of determining the specific gravity, and

the instrumentation generally, the work has been exceptionally accurate, and we may depend upon the results, which being the case, I will not burden you with the whole details of how they were brought about, but will content myself with recalling to your minds what they are. To recapitulate, I will say that Professor Black's own summary of the scope of the work on the teeth is as follows:

First, the variation in the percentage of lime salts in the human teeth.

Second, the relations of these variations, if any, to the diseases of the teeth, especially caries, but including diseases of the peridental membrane, the supposed loss of lime salts, and softening of the teeth in pregnant women.

Third, the percentage of lime salts to the strength of the dentine and to the strength of the teeth.

Fourth, the force used in ordinary voluntary effort in biting and in masticating, and the relation of this force to the strength of the teeth.

It did not include possible variation in the composition of lime salts, nor did it include variations in the hardness of teeth to cutting instruments. It was found that the variation in percentage of lime salts in all the teeth employed, regardless of condition or from whom extracted, was so very slight as to be practically none at all, being but a gradual increase of about two per cent. in the lengthy period from youth to ripe old age. Of any differences noted, strange to say, the greatest variations were in the different teeth from the same individual, leastwise as compared with the average difference in the teeth of different persons. In the main this unvarying proportion of lime salts was borne out by the specific gravity, which varied but slightly in the different teeth, the greatest difference noted in over a hundred cases being but .097 of a volume. However, such differences were obtained in particular instances as would lead one to believe that the specific gravity does not entirely depend upon the percentage of lime salts. As to the strength or ability of dentine to withstand pressure without fracture or crushing, it also is not directly dependent on the percentage of lime salts, as we shall subsequently see, the condition of the organic matrix seeming to play a more important part.

It was conclusively proved that there was no withdrawal of lime salts from the teeth of women during pregnancy.

It was proved that there is no difference in the density of teeth lost through disease of the peridental membrane.

It was proved that the average tooth affected by caries is by no means deficient in lime salts, nor did such teeth fall short in point of specific gravity.

It was shown that by subjecting a tooth to a temperature of 200° F. for twelve hours, an average shrinkage of about 1.81 per cent. would result, there being a decided difference, however, in the shrinking capacity of dentine and enamel, it being practically *nil* in the latter as compared. This difference it is which causes the checking which occurs when teeth are dehydrated, which fact should be borne in mind when preparing pulpless teeth for filling, since the pain limit would not be a factor in gauging the permissible extent of our hot-air application.

In relation to the hardness and elasticity of dentine, it was shown that two hundred and fifty pounds was the average stress required to crush blocks of dentine .08 of an inch cube, cut from the various teeth from the different individuals of varying ages, and clinically hard or soft, carious or otherwise. As for the elasticity, the blocks were strained or compressed 2.09 per cent. of their thickness under a stress of one hundred pounds, and compressed 4.03 per cent. under a pressure of one hundred and fifty pounds. The elasticity did not depend upon the density of the teeth or upon the percentage of lime salts, yet it apparently varied somewhat according to the condition of the organic matrix, in proof of which it was shown that marked deterioration in strength and elasticity occurs in pulpless teeth which have been left open until perhaps decomposition has to some degree altered the organic structure.

It was shown that the presence or absence of caries is in no way a factor in determining either the hardness or elasticity of tooth-structure, or *vice versa*, the hardness and elasticity in no way influencing caries. The crushing stress varied from two hundred to three hundred pounds, the high stress almost invariably characterizing the teeth of young people.

The prevailing idea of white teeth being soft was found to be an error, an example of such kind resisting a strain until the application of three hundred pounds.

The strength of dentine having lateral support was shown to be very great, standing easily a stress of three hundred and fifty

pounds, even the weakest tooth in need of and suitable for filling being able, when properly prepared, to withstand any crushing stress to which it is likely to be subjected.

It was shown that the enamel is decidedly the inferior of dentine in withstanding crushing stress, the average specimen crumbling at from thirty-five to seventy-five pounds. Therefore the great reason for not unnecessarily cutting away dentine from the enamel walls in the preparation of cavities for filling, as the chances for permanency are materially lessened.

The main points of Dr. Black's conclusions are as follows:

The teeth are strongest in youth and early adult age, diminishing somewhat in strength with advancing years.

Teeth that have lost their pulps and have become discolored lose strength in a marked degree, apparently from the deterioration of the organic matrix.

There is no basis for the supposition that the teeth of children under the age of twelve years are too soft to receive metallic fillings, since they are just as hard, just as strong and dense, and, with the exception of an unimportant and inappreciable difference, contain just as much lime salts as the teeth of adult age. There is, then, only one basis for the selection and adaptation of filling-materials to different cases. This is, for one to select the material which he can manipulate so as to make the most perfect filling considering the circumstances, his own skill, durability of material, and the patient's ability to bear its insertion.

The active cause of caries is a thing apart from the teeth themselves, acting on them from without. It is, perhaps, something in the constitution operating through the oral fluids that is the chiefest factor in determining the liability to caries of the teeth of different individuals, the rapidity and extent of caries depending, of course, upon the activity of the exciting cause. From this the logical inference is that caries of the teeth is not dependent upon any condition of the tissues of the teeth, but upon conditions of their environment.

There is no basis for the supposition that calcic inflammation of the peridental membranes or phagedenic pericementitis (so-called pyorrhœa) attacks persons who have dense teeth in preference to those whose teeth are less dense.

There is no basis for the treatment of pregnant women medicinally with the view of furnishing lime salts to prevent the softening

of their teeth, or with the view of producing better calcified teeth in their offspring.

So much for the lime salts, the organic matter, the elasticity, the density, and the hardness of different teeth. Now, as to the stress to which they, and fillings, will likely be subjected. In the experiments conducted to determine the force exerted in the closure of the jaws it was shown that the physical strength of the individual was not the chief deciding factor. Rather the condition of the pericemental membrane was the more potent one, for in biting down on the gnathodynamometer (the instrument used in determining the strength of bite) one does not cease in the closure of his jaws because of lack of strength, but rather because of the pain occasioned. The pounds pressure necessary to produce pain varies greatly with different individuals, those habituated to the mastication of hard food having accustomed the peridental membranes of their teeth to stand more pressure than those whose diet consists chiefly of soups and semi-solid foods. The value of tooth exercise is therefore apparent. The variation in bite of fifty individuals was from sixty to two hundred and seventy pounds, the average being one hundred and fifty pounds. But we cannot take into consideration the average bite, though it may represent that which will be most often met, but we must be prepared to meet the extreme stress to which the teeth and fillings are likely to be subjected. Even so, as above stated, we find that even the weakest teeth, suitable for filling, are amply strong to withstand the stress providing they are properly prepared, which latter feature decides largely the success of the filling-material they are designed to receive, the other factors, of course, being the preparation and manipulation of the material.

It was shown that many fillings inserted by the average practitioner are not at all adapted to withstand the impact occasioned in the mastication of certain hard food-stuffs. Other fillings properly inserted into properly prepared cavities are well able to withstand the strain. The consideration of this leads us to a very important part of this very important work. While Professor Black has taken up amalgam for his first consideration, we will take the privilege of altering the arrangement somewhat, and first briefly call attention to some of the physical properties of gold, the attributes of which metal as a filling-material entitle it, however, to a more careful and extensive consideration than I can at this time pretend to give.

GOLD.

The aim in view in making the experiments with gold was to establish the correlation that exists between the strength of fillings made with this material, the teeth in which they are placed, and the stress brought upon them by the impact occasioned in the crushing of hard food-stuffs, and the occasional biting of hard particles during such process, and incidentally to establish an exact way of determining the efficiency or inefficiency of the different methods of preparation and manipulation of gold, that we may in our operations be governed accordingly.

Experimentation showed that the maximum density of gold very closely approximates 19.4, and this was taken as a basis of comparison. Cast gold of about this density—19.3—in cubes of one-tenth inch section when subjected to a pressure of two hundred pounds shortened 4.12 per cent., and under three hundred pounds the average shortening was 11.21 per cent. The least shortening noticed in any of the specimens of cast gold under two hundred pounds pressure was 2.41 per cent., 9.95 per cent. at three hundred pounds, and 14.43 per cent. at three hundred and fifty pounds, all of which give a good idea of the behavior of cast gold under pressure. As to the effect of hammering, such as would occur during the ordinary process of filling with mallet blows, experiment showed that after a bar had been thoroughly hammered, the average shortening under a stress of two hundred pounds was only .48 per cent., less than one-half of one per cent., as compared with 4.12 per cent. in the case of the cast gold. The average shortening under three hundred pounds was 1.98 per cent., as compared with 11.21 per cent. in the cast but unhammered bar. None of the cubes showed any shortening under a pressure of one hundred and fifty pounds (a point to be remembered), while in the case of the cast gold the minimum shortening noticed in any specimen under this pressure was 1.04 per cent. From this we may judge of the value of rigid hammering of gold fillings exposed to wear compared with the process of inserting such fillings by hand-pressure. As to density, it was found that hammering is not the deciding factor; rather the avoidance of making air-spaces by bridging the pieces of gold is the important point; therefore, in the insertion of fillings not exposed to wear, hand-pressure will answer, since it is possible to obtain adaptation and density in this way, though this method in most instances possesses no advantages

over combined burnishing and malleting, and has the disadvantage of being less rigid.

Fillings made by different operators by their different methods of manipulation and with the different preparations of gold they usually employ were tested. The density of each filling—how nearly it approached the standard 19.4—and the different degrees of resistance each had to impact or crushing stress was noted and the results carefully tabulated for comparison, so that conclusions might be drawn as to the value of the different preparations of gold and the methods of insertion for given cases. I do not propose giving the whole table of the comparisons of the various fillings made by different operators, but we may consider one or two which have a bearing on this difference in hand-pressure and mallet-force.

Experiment No. 1. Gold-foil No. 4. Mallet-force as in ordinary method of filling teeth not exposed to great wear. The density obtained was 17.4, and the filling shortened 1.3 per cent. under two hundred pounds pressure, whereas a filling inserted by hand-pressure—White's cylinders unannealed—gave a density of only 14.6, and shortened 31.1 per cent. under pressure. These different fillings were, however, made by different operators, and we will have to make allowances in the matter of a difference in manipulation, though a comparison of the fillings made by hand-pressure and mallet-force shows a great difference in point of strength.

A study of the table shows that the fillings made of non-cohesive gold-foil are much less dense than those made of cohesive. The greatest force that could be employed with comfort to a patient produced with non-cohesive gold a density of only 16. It was found, too, that such fillings go to pieces under very light stress. In relation to lining cavities with a very small amount of non-cohesive gold, and finishing with cohesive, it was found that the strength of the filling in such instances was not materially lessened. When, however, a considerable amount of non-cohesive gold is employed, and a comparatively thin veneering of cohesive used to finish, the strength is notably diminished, though the density is not lessened. The value of this observation to us is that, in the filling of proximal cavities where we wish to place soft gold at the cervix for better adaptation, we must be careful to use only a very limited amount, lest we materially weaken a filling which is exposed to much stress. It has been found, however, in relation

to fillings made entirely of non-cohesive gold-foil, when surrounded by four walls, that even though they may press down in the cavity under stress, they adhere to the margin perfectly; when, however, the bulk of filling is soft gold, and a veneer of hard gold is added, this property of readaptation is lost, and failure results; therefore, when a filling is to be largely of non-cohesive gold, it is best to finish with the same. This is a practical point in the filling of occlusal cavities in the teeth of children, where the limit of enduring force for insertion would only make a weak filling of cohesive gold. It is better in such cases to use the non-cohesive variety. Even though no more density is attained, the ability of the material to hug the margins in the event of its condensing upon itself should give it preference.

In reviewing the table given by Dr. Black, it may be noticed that in many instances the densities of the fillings were below 16, and the resistance to crushing stress was very low, some shortening as much as from ten to thirty-two per cent,—too much, in fact, for such fillings to be of service in occluso-proximal cavities much exposed to mastication, the force of which, as will be remembered, is in many instances very great, easily sufficient to cause such a condensation of many of the fillings as to drive them down into the cavities away from the marginal edges, the resultant evils of which are easily apparent.

The experiments show that we should provide for a stress of at least one hundred and fifty pounds, and often for a greater stress. This strength can only be gotten by using cohesive gold, and condensing it well by the application of sharp, hard blows, taking care, meanwhile, to secure sufficient density and adaptation to guard against a leak and consequent decay. A great many failing fillings show that the cavity has not been properly prepared,—the tooth not cut out sufficiently to make a self-cleansing filling, and the cervix usually not properly cut so as to insure a seat for the fillings with area sufficient to support the stress applied on the occlusal portion in mastication. The method, then, of cutting away a part of the occlusal portion of the tooth, forming a dovetail to insure anchorage, and incidentally to bear a portion of the stress of mastication, together with the preparation of the cervix so as to form a perfect seat to withstand the major portion of the stress, at once approaches the ideal in cavity preparation. The anchorage secured by the dovetail groove in the crown portion is sufficient,

with a broad seat at the cervix, to keep the filling from tipping. The absurdity of the method of some operators of cutting small grooves and pits into the lateral walls of proximal cavities, with a view of obtaining additional strength, is at once apparent when we consider that it must necessarily weaken the walls some, and the small spurs of gold ordinarily thus produced at the outside would not support a strain of more than fourteen pounds, totally inadequate to insure the filling from tipping away from the walls when much stress is brought to bear, and we have seen that one hundred and fifty pounds is the average; hence the many failures noticed in fillings thus prepared, they being soon forced away from the walls, and the leak produced permitting bacterial invasion and subsequent tooth-decay. It appears that the condition of the pericemental membrane is at times the most serious handicap to the insertion of gold fillings with the force that should be used in order to get the best results in occluso-proximal cavities. The pericemental membrane is very often so sensitive to pressure as to make the force required to produce hardness unbearable, though the teeth are in themselves abundantly strong to withstand this required force.

When such a condition arises it is often occasioned through sensitive dentine, the tooth perhaps having had a cavity for some time, and, being favored during mastication, the peridental membrane has become sensitive from disuse. In such instances Dr. Black recommends that the teeth be filled temporarily with some plastic for relief of sensitiveness, and the patient be directed to bring them into full use. The sensitiveness of the pericemental membrane, under such treatment, will in a few weeks or months pass away, and the malleting may then be borne with ease. This is a practical point worth noting, and would, it seems, in itself warrant our recommending to our patients and the public generally the use of Zweiback, well-rusked crusts of bread, Bent's water biscuits, and such class of foods, they being indispensable for proper tooth exercise, to say nothing of their value as food-stuffs. It would seem that thus strengthening the pericemental membrane would not only make filling operations possible, but render the membrane less liable to disease. The prehistoric races suffered little from pyorrhœa, and whilst their better constitutional condition may have been the chief reason, still the fact that they lived largely on natural food-stuffs requiring great crushing stress in-

sured the pericemental membrane being strong, and this may in part account for their immunity.

Dr. Black found that fillings of a density of 15 and below were sufficiently porous to absorb animal matter, since they contain twenty per cent. of air-spaces. The tests of many gold fillings made by different operators show that the average dentist does not make his fillings dense enough.

The natural deduction from his experiments in relation to density and rigidity is that to make a *dense* filling the gold does not necessarily require heavy malleting, but it does require that it be used in thin pieces, carefully and evenly laid, and that the malleting be complete over the surface of each piece.

Where a *hard, rigid* filling is required, heavy malleting of the gold is necessary, care being taken in the laying of the gold if great density is also required.

As to the size of plugger-points to be used, I would say that Dr. Black has invented an instrument, the tuptodynamometer previously mentioned, which is designed to give us a clearer insight as to the effectiveness of different-sized plugger-points and the force of blows best adapted to the requirements of different fillings. The scope of the work done with the aid of this instrument has not as yet been published, and I do not feel at liberty to speak of many of the interesting facts brought to light by its employment. We may, however, look forward with pleasure to the publication of these experiments, since they throw much light on this important question.

AMALGAM.

The complete review of Dr. Black's experiments with amalgam would take so much time that I must forego largely their consideration for the present. However, I feel disposed to say a word or two as to certain results obtained.

The discovery of the property of flow in amalgams—that property of change of mass form from molecular motion under stress—seems at once to explain the cause of failure in so many amalgam fillings, the pressure of mastication causing such change in form at times as to drive the filling away from the tooth wall.

As proving the worthlessness of gold and platinum as modifying metals in amalgam alloy, it was shown that they markedly increase flow and lessen rigidity, and are therefore positively detrimental, their only possible virtue being to improve color.

Zinc likewise should not be used, even small amounts imparting a slow but continual expansion.

From the tests made it appears that copper is the only metal which can with impunity be used as a modifying element, since it imparts additional rigidity and lessens flow.

It was proved that silver is the metal which tends to produce expansion in an amalgam, that tin is the element which tends to produce contraction, and that the production of an amalgam that will neither shrink nor expand depends primarily upon a careful apportionment of these metals in the alloy, so that the shrinking produced by the one will be overcome by the expansion of the other.

The effect of annealing, so-called aging, whereby some change takes place in the molecular construction of the alloy, is to lessen the expansion of the alloys which expand, and increase the shrinkage of the shrinking alloys.

An alloy which when fresh cut shows neither shrinkage nor expansion will contract perceptibly after the lapse of time, due to a slow process of annealing.

To produce a non-shrinking alloy which will not change by process of time,—a temperature change,—it is necessary to use silver sufficient to compensate for the shrinkage produced in the process of artificial aging or annealing. Amalgam made with such an alloy will not change.

The alloy which showed the least change when fresh cut was of the formula, silver 65, tin 35, which curiously corresponds closely to the percentage of the metals were they combined chemically as Ag_2Sn , in which 64 silver and 36 tin practically represent the composition.

The alloy which showed the least change of form after annealing was found to be 72.5 per cent. of silver and 27.5 per cent. of tin, which curiously represents very closely the percentage of the metals taken as a compound Ag_3Sn , which would be 73.3 per cent. silver and 26.7 per cent. tin.

Modifications of these two basal alloys by the addition of five per cent. of copper is permissible, and often advisable, since greater rigidity and less flow is produced, its tendency to discoloration being the only objectionable feature to its employment.

Gold, platinum, zinc, bismuth, cadmium, and aluminum are all objectionable because of imparting undesirable properties, the

objection to aluminum being the enormous expansion which it causes.

In concluding this brief consideration of amalgams, I will say that the crushing stress of blocks of a desirable formula, .085 inch cube, shows a resistance of from three hundred and fifty to four hundred pounds, which is amply sufficient, and, taken with unchanging form, makes this material very valuable for stopping carious cavities in teeth not exposed to view.

INSTRUMENTS OF PRECISION.

Dentists as a class have shown wonderful and exceptional genius in the invention and perfection of mechanical instruments and appliances and their adaptation to various features of their work. On the other hand, they have given too little attention to the invention and perfection of instruments of precision with which to determine effectiveness of methods, and to test wherever possible the value of so-called clinical evidences, and show when they are features of fancy and when matters of fact.

A century or two ago there was no accurate means of determining the changes of bodily heat and the variations of the pulse-beat, both of which, to all seeming evidence, did change under different circumstances. Much difference of opinion prevailed, and arguments were frequent, and of course unsettleable, until Galileo, who, besides inventing the compass to guide us with unerring accuracy in the matter of direction, invented early in the sixteenth century the first crude thermometer which gave the first accurate means of heat determination. Almost simultaneously he suggested the oscillation of the pendulum as a means with which to test the frequency of the pulse-beat. Both instruments ultimately put a quietus on the dissension caused by the difference of opinion regarding these two physiological phenomena, since they gave some accurate and indisputable means of determination. The perfections of these crude suggestions of Galileo give us to-day the accurate vacuum thermometer and the wonderful and valuable instrument of precision known as the watch.

From Galileo down the different opinions regarding physiological phenomena, opinions often widely at variance, have been settled only after the invention of some instrument of precision, until to-day over five hundred such important appliances are in daily use, and each year sees valuable additions.

Particularly from a dental stand-point Dr. Black's inventions are steps in the right direction, and, like many predecessor instruments of precision which have upset men's opinions, they are not cordially greeted by many whose ideas are at variance with the evidence the employment of these instruments brings forth. Why have we boldly stated that gold and platinum impart additional edge strength in amalgams, when, as a matter of fact, so-called edge strength has been proved to be a misnomer, and, so far as its being analogous to crushing stress is concerned, both metals decrease this property? Why have we said that teeth vary greatly in composition as regards calcium salts, when this has been proved to be not true? Why have we said that teeth are not so strong in youth as in adult age, when, if anything, they are stronger? Why have we said that certain diseases of the pericemental membrane attack most frequently dense teeth, when, with an inappreciable difference, they vary not in density? Why will some of us persist in the exclusive use of hand-pressure to build up with gold corners which will be much exposed to wear, when great rigidity cannot be thus obtained? Why do we answer, and present as proof, that our clinical observations have shown that some fillings thus inserted have been very enduring, when we have had no accurate means of determining the stress to which they have been subjected? and that while one or more such cases may have come under our observation, perhaps even in the mouth of some apparently strong and vigorous man, how do we know that it has not been through some strange fatality of circumstance that they have lasted,—perhaps because of having been subjected to but little strain?—for the bite varies greatly in different individuals, and strength of bite is not gauged by the strength of the individual. The answer to these questions is, *that we have based our belief largely or wholly on clinical observation.* Now, clinical observation is not without great value, and could not and should not be dispensed with, for by demanding exact comparisons and scientific explanations it creates the necessity for accurate instrumentation and experimentation; but, after all, it is liable to great error, as the experience of history has shown. If, now, with the employment of such instruments, the evidence produced is at variance with our opinions formed from clinical observation, why cling to them in the light of positive but contrary instrumental evidence?

To illustrate my meaning, I will say that there has been great

variance in matters of opinion concerning coagulants. Should we not, in the light of a preponderance of demonstrable evidence, shown by the practical experiments of Drs. Kirk and Truman, accept as true that coagulants are not self-limiting?

Dr. Black's great work goes to show that, since teeth are practically all alike as regards composition and physical characteristics, other than faulty developmental construction such as pits and grooves, they present no special predisposition to caries, the active cause of which he believes to be not a condition of the teeth themselves, but a circumstance of their environment.

Let us not be in too great haste to laugh at this supposition. In 1835 the opinion was first advanced that caries of teeth was caused by development of acid through fermentation at the exact spot of the carious process, but this was not proved until some fifty years later, when Miller, of Berlin, proved the truth of this supposition and demonstrated the nature of the process.

Now, as to the primary exciting cause. Dr. Black has shown the tissues of the teeth to be universally the same, with no special predisposition to caries, and argues the possibility of some constitutional agent operating through the oral fluids exerting the primary causative influence. Careful experimentation by the bacteriologist and chemist may yet prove the truth of his conclusion, in which event, having led up to the suspicion, the proof, besides being of great use in its bearing on dental prophylaxis, will be a further testimonial to the value of accurate methods of scientific research involving the use of instruments of precision.

CASE OF IRREGULARITY OF SUPERIOR CUSPID.¹

BY DR. H. S. BASCOM.

MR. PRESIDENT AND GENTLEMEN,—The case of irregularity to which I have been invited to ask your attention to-night is not one involving several irregular teeth brought after weeks or months of labor to a successful finish, but, on the other hand, it is a case of one tooth erupted out of its proper position and being moved to a place where it would look as it ought to look. And although it has been worked upon for weeks and even months, it still is very far

¹ Read before The New York Institute of Stomatology.

from being in its proper position. The principal trouble was caused by an accident at the very beginning.

To be as brief as possible, the case is simply this: A young lady of sixteen called upon me with her mother to know what was best to do about the left upper cuspid, which was a little more than half erupted and was located almost directly over the lateral incisor. An examination of all the teeth showed that a well-nigh perfect articulation existed on the right side and including the left central, first and second left bicuspid, and first and second molars. The left lower cuspid was standing a little out of its proper position, so that the left upper lateral incisor shut inside the lower cuspid. The upper left lateral incisor and first bicuspid nearly touched each other.

Under the circumstances, what was simpler to do than to remove the left first bicuspid and move the cuspid into the place occupied by the bicuspid. This I suggested to be the better way, everything considered, as they did not care to interfere with the lower teeth.

I was at that time moving a right upper cuspid for a friend of this lady. They decided to wait a little time and have something done later, possibly to see how the other lady's tooth succeeded, which I am pleased to say did succeed to the satisfaction of all concerned. Therefore, I received a second visit from the would-be patient, and was asked to proceed as rapidly as safety would permit. An impression of both upper and lower teeth was taken, and models secured. On the upper plaster model I cut off the first bicuspid and proceeded to make my regulating device. A few days later, by appointment, the patient came in. Beta-eucaine was injected and the first bicuspid was extracted, but the root broke off just where the two small roots joined the main root (this was where the accident above referred to came in). Looking at this broken root, the two roots were demonstrated to be of an unusually small size. This was the first time I ever broke a tooth in extracting for correcting irregularity. I dismissed my patient to come the next day. In the mean time I sought for information in text-books and dental literature as to what was best to do, but I discovered nothing satisfactory. The next day I placed on the fixture, which was kept in active working order for a month, when I discovered that the second bicuspid and first molar on the left side had moved a little outward without apparently moving the cuspid. A new

impression was taken and a new and stronger fixture was made. A month later the tooth had gone back a little more than one-sixteenth of an inch. This brought me to April 1.

In the mean time I had asked dentist after dentist for advice as to how to move that tooth, how to get rid of that root, but had received no satisfactory answer, when I decided to apply to Dr. Jackson, of this city. He replied that the fixture was correct, except to extend a wire back of the second molar, and thus get more anchorage. I therefore made a new fixture. He also suggested cutting out the root with large-sized pointed fissure burs with the dental engine, cutting it out thoroughly, including considerable of the alveolar process connected with it. This was just the information I wanted. Why had I not thought of it?

I immediately asked permission of my patient to remove that root, but nearly three weeks elapsed ere my request was granted. I procured a spear-shaped drill, a large-sized round excavating bur, and a few large-sized dentate pointed fissure burs. I found these burs to work best; of course they soon became cloyed, but a clean one was substituted; in this way the cutting was soon completed, and by the use of beta-eucaine was nearly painless. In using the burs, the gum where the tooth was extracted was cut away just enough to form a flap and brought over one side. The instrument was pushed into the place where the tooth was extracted (which had by this time become partially healed), and while revolving was pushed up to the broken root. The feel of the bur was easily to be noticed when the root, and also when the more porous process, was being cut. A week later the tooth gave more signs of moving. The good work was carried on until about July 1, when the tooth nearly touched the wire hook near the second bicuspid, and a change in the fixture must be made.

At this time I was informed the patient was going to the seashore, and could not conveniently see me but once or twice more; therefore I made a fixture which is little more than a retaining device. During July I saw her twice, and during August she went to the mountains, and I saw no more of her until September 10, when her teeth were in the condition as you see them on the model. The fixture had become somewhat loose and had not been worn for six weeks, therefore the cuspid had gone back some; and now she has gone to a boarding-school away from New Haven, and I fail to see how I will be able to finish my work.

THE TREATMENT OF UNFILLED ROOT-CANALS.¹

BY DR. T. W. ONDERDONK.

MR. PRESIDENT AND GENTLEMEN,—The subject I have chosen to-night is, The treatment of teeth which have been filled for a long time, and comfortable, but with unfilled root-canals.

I desire, first, to ask the society's pardon for bringing forward this subject. It is one, however, which is responsible for a great many mistakes on my part, and I wish to secure the opinion of as many as possible concerning the treatment of this class of teeth.

My treatment is as follows: For a clear comprehension we will make an arbitrary division: first, pericementitis; second, acute and chronic abscess; third, those disclosed by accident.

Pericementitis.—Not being sure of the history, as to whether the root is filled or not, I paint the gum with aconite and iodine, give the patient capsicum plasters (with instructions how to use them), also chloroform and listerine equal parts to apply to the sore spots on a piece of cottonoid. If this affords relief, I consider the treatment ended.

An acute abscess I consider only a second stage of pericementitis that has progressed too far to stop short of suppuration. My treatment is to evacuate the pus through an external opening, and when the soreness has subsided open the pulp-chamber, cleanse, disinfect, and close at once.

Chronic Abscess.—I open the pulp-chamber, cleanse the canal or canals, enlarge the apex sufficiently to allow the passage of disinfectants, thereby thoroughly cleansing the abscess tract.

Those disclosed by Accident.—When I say accident I mean those teeth which have new decay, broken enamel, or discolored teeth which we wish to crown, and when opened are found to have dead pulps. My remarks to-night apply particularly to these teeth. Here again we will make an arbitrary division,—first, when we find dry and gaseous conditions; second, creamy pus filling the pulp-chamber; third, watery conditions.

First.—When I open the pulp-cavity and find dry or gaseous conditions, I look for evidence of an old abscess. If found, I open the pulp-chamber and root-canals, thoroughly disinfect, and fill at

¹ Read before The New York Institute of Stomatology.

once, completing the operation at one sitting. If no evidence of abscess present, I treat same as next division.

Second.—Condition of creamy pus. I open into the pulp-chamber and canals, washing out the contents with warm water followed by hydrogen dioxide, sealing the cavity or not as seems best, being governed by the amount of soreness.

Third.—Watery conditions. Hang out the danger signal, as trouble must be expected. Open the pulp-chamber and wash out the contents, but do nothing that will close the apex at first sitting. I could quote any number of cases substantiating my practice, but the general plan as suggested by Dr. F. Milton Smith in his paper read before this society is the method I have followed for some time, with a few changes (one important one). Quoting from Dr. Smith: "In summing up he would say that he regards as essential to success in root treatment, first, the rubber dam; second, free direct access; third, thorough cleansing mechanically and antiseptically; fourth, getting the antiseptic through the root; fifth, perfectly filling the root, immediately upon getting an aseptic condition, with an antiseptic root filling; sixth, sufficient confidence in the method to insure thorough work and the minutest attention to details."

Now, I would indorse all of this most heartily except the fifth statement,—*i.e.*, the immediate filling upon securing an aseptic condition at the first sitting, as I understand. How are we to know that we have secured the desired condition? I would suggest, instead of the immediate permanent filling, the insertion of a root-treatment on cotton or paper points, completely filling the canals, sealing the cavity with a temporary filling, completing the operation at the next sitting if the tooth is comfortable, giving a second disinfection from the apex. At least, I feel that the safest way. As sometimes we are in need of securing relief, I know of no better way than by the removal of root-dressing. At all events, we secure the benefits of an immediate closure, and have at hand the means of easy relief in case of need.

I would denominate the presence or absence of pain the physical test. I wish to suggest (although it was not my intention to do so at this time) what I am pleased to call the scientific test,—*i.e.*, having a culture made from the cotton dressing, also from a fresh specimen taken after a thorough disinfection when we think the root is ready to fill, and, with the aid of the bacteriologist, *know*

when we have secured an aseptic root. The success of immediate root-closure is without doubt secured by the removal of all dead matter, thorough disinfection, and the introduction of an antiseptic root-filling in a demonstrated aseptic canal. In cleansing I use the Donaldson broach, sulphuric acid, and in favorable cases the engine reamer to clear the canals. In disinfection I rely on hot air, hydrogen dioxide, and iodoform in ether. In filling I prefer gutta-percha points for all large canals; for the smaller ones a mixture of zinc oxide, carbolic acid, and iodoform, forcing it into all recesses possible.

I want to say a word about gutta-percha points. I believe them to be the best root-filling if the canal is absolutely dry; if it is not dry, I think they are the worst thing that can be used. I dry the root by means of chloroform or ether, with iodoform in solution, then the hot point and hot air. I introduce a gutta-percha point a little smaller than the canal, the point being moistened with chloroform and having a bit of iodoform on the end; this is carried to the extreme end of the canal; again use the hot air and soften the gutta-percha to a creamy consistency, and with pressure force into place, and I believe that canal will be closed as well as can be done by hand of man. Supposing that a portion has passed the end of the root up into the jaw, I know of no material that would be retained as well.

I hope these remarks will be accepted in the same spirit which prompted me to prepare them,—in order that the young man just starting in practice may save himself trouble and his patients suffering by not attempting to fill all roots at the first sitting without reference to unfavorable conditions which may be present.

STRAY THOUGHTS ON DENTAL HYGIENE.¹

BY DR. A. F. DAVENPORT.

PERHAPS there is no subject in the realm of scientific inquiry and medical or dental research which is fraught with so much importance to the human race as a careful study of the laws of hygiene. Our organs suffer largely through our ignorance or neglect of the physiological laws which should govern them.

¹ Read before The New York Institute of Stomatology.

Realizing the great importance of a knowledge of the physical facts that bear upon the hygiene of the mouth, as well as upon the health of all the organs of the body, many years of undivided attention given to the care of the oral cavity leads me to speak with some confidence in regard to the dental organs.

Admitting the undeniable fact that the quality of the teeth varies according to the physiological or pathological conditions of the patient, still, were we able to commence with the young with strict hygienic habits in regard to the mouth and teeth, a very large proportion of the work of the dentist could be dispensed with.

The most important subject with us is not only how we can perform the best operations, but what can we do in the way of encouraging prevention. We should try to understand the cause as well as the remedy, and be teachers as well as practitioners, or we shall be left behind in the twentieth century march of dental progress.

There is a good deal of force in the remark said to have been made by Dr. Holmes, that "If we would improve the general health of our children we must begin two hundred years before they are born." We do not live long enough to see the effects of our teaching on the coming generations; neither are we able to tell just how much we can do in the way of controlling the nutritive development of the teeth in embryonic life.

My observation has led me to think that most dentists are inclined to accept the situation as they find it, and are content to spend most of their time and energy in trying to remedy the defects of the dental organs, instead of trying to get at the causes which underlie the entire fabric of dental science. If the physician and dentist would give more attention to prevention, and less to the cure of disease, it would be vastly better for mankind. It is a humiliating fact that in some respects, the farther we become removed from barbarism the more we degenerate physically.

Dentistry appears to be one of the outgrowths of civilization and is a striking example of the vast difference that lies between the civilized man and the barbarian.

My observation leads me to believe that our teeth do not have work enough to do to keep them in a healthy condition. The gums to be healthy need a great amount of friction, very much more than they get in ordinary mastication; this would give us fewer cases of "*pyorrhœa alveolaris*" to treat. It is a very common thing for

me to tell my patients that the proper use of the tooth-brush would do more for them than the services of a dentist.

Dr. Whitney, one of my classmates at the dental college, and for over forty years a practising dentist in Honolulu, says the natives there rarely need the services of a dentist; the cocoanut grows in abundance in those islands, and he tells me the natives tear all the coarse husk off the cocoanut-shell with their teeth.

If the teeth were put to harder use, fewer tooth-brushes would be needed. I am satisfied that our first thought should be the care of the teeth of the young. For many years I have done all I could to have the teachers in the schools of our city add to their daily teaching "the care of the mouth and teeth" of those under their charge, especially in the primary grades, and this is now, with us, I think, pretty generally done, so that the effects are already quite manifest. The subject of the care of the teeth of children in the schools is one which I understand has been agitated somewhat in the State of New York.

When I was in London a few years ago it was my privilege to hear a report read by Dr. Cunningham, of Cambridge, from which I noted a few facts, which showed that the subject of the care of the teeth of children in the schools of England was receiving a good deal of attention. This report showed that the teeth of some two hundred thousand children had been examined. Among other places in England the teeth of the children in the schools of Hanwell were also examined, which resulted in the appointing of a dentist at a salary of eighty pounds sterling per year. The number of children at Hanwell was one thousand; of that number, nine hundred and three were carefully tabulated; each child was to have a tooth-brush and to pass through the hands of a dentist twice a year. This policy, which is being agitated in England and also in this country, is certainly one of hope for the coming generations. The kindergarten and primary teachers should bring up the subject of mouth sanitation and tooth preservation before their classes. For instance, let the teacher say, among other morning exercises, "As many as have brushed their teeth this morning, raise their hands." "All those who have not brushed their teeth this morning, raise their hands." "Also all those who have not a tooth-brush, raise their hands," etc., etc. Some such exercise as this could not fail to have a good effect.

I understand that a bill was some years since introduced into

the New York Legislature to make teaching in regard to the care of the teeth of children compulsory in the public schools. I should be glad to hear what progress is being made by the "Empire State" in this direction.

A writer in the *Educational Review*, upon physical training, says, "If the school authorities will undertake this work, there is no way in which it can be so well and economically done as by making physical training a part of the school curriculum."

Formerly physical training has not included the care of the teeth, which I trust in the near future it may. When prizes are offered in our schools for the strongest muscles, the straightest back, the best chest expansion, the rosiest pair of cheeks, they should also include the best-cared-for mouth and teeth.

I have no doubt, if the mouths of the children in our schools could be examined by competent persons, carious or diseased teeth treated or removed, and instruction given and enforced with regard to the intelligent use of the brush and daily care of the mouth, the death-rate of this country would be very materially lessened, the percentage of illness much reduced, and a stronger and more vigorous race result in consequence of these prophylactic measures.

In Paris, this year, is to be held an athletic festival, and it is hoped that the great progress that is being made in physical culture throughout the world will also include the organs of mastication.

When a patient takes my chair I always make it a point to first note the condition of the mouth, and make any suggestions I think necessary as to its care, giving them to understand that the care they daily give their mouth and teeth is of far greater importance than any service I can render; in other words, I do all I can to make my patients self-supporting.

I have not chosen this subject thinking it was in any respect a new one; in fact, I am well aware that it would be presumption for me to attempt to bring anything new in dentistry to such an intelligent body of practitioners as I see before me, fully realizing that your field furnishes far greater opportunities for observation than does a practice in a small country city. I have chosen this subject more especially because it is one that worries me most, in hopes that by so doing I might hear something from you that will help me to solve the perplexing problem, as also to give you an idea of what has been the summing up of my thought after forty years of practice.

Abstracts and Translations.

AFTER-RESULTS OF TREATMENT OF CARIES BY GERANIUM-FORMOL.¹

BY MM. C. ANDRÉ AND G. DE MARION.

IN presenting the results of treating caries of the third and fourth degrees by geranium-formol, a method we introduced several years ago, we have a double purpose. First, to show the success of the method when properly carried out; secondly, to reduce to their real value proceedings which it has been desired to connect with the formol method, and which show that their authors have a complete misunderstanding of the useful properties of this substance for the purpose we are dealing with.

This question of the useful properties of formol is one of great importance, and we feel ourselves bound to accurately determine them. In order to do so let us consider the problem at the commencement, and see what is the condition of a tooth affected with caries of the fourth degree. The pulp has been destroyed and liquefied by putrid fermentation; in its place we find the products of its destruction, and among these products a quantity of infectious germs. The condition is much the same as when animal matter is destroyed in contact with the air; the canals are filled with a brown substance of soft consistence, moisture, emulsified fatty acids, sulphuretted and phosphorized ammoniacal derivatives, and these, especially the latter, which are soluble in water, are disseminated in the dentinal tubes.

Now, when formol is brought in contact with putrid products there results this remarkable fact of the almost instantaneous deodorization of these residues if the formol has been used in sufficient strength. This important property has been observed and noted by all those who have used formol in treating the dental canals, as well as by surgeons who have employed weaker solutions for washing infected wounds; but we were the first to give a

¹Translated from *L'Odontologie*.

rational explanation of these facts founded upon the reciprocal chemical action of formol and of ammoniacal products.¹ We may repeat in a few words the facts which serve as a basis for this theory.

When equal volumes of formal and ammonia are mixed together much heat is evolved, and the alkaline odor disappears. The two bodies combine thus: 6 molecules of formol + 4 molecules of ammonia = 1 molecule of hexamethylenamine + 6 molecules of water. The reaction is rapidly effected, and we are sure that it is complete at the end of a quarter of an hour. The ammonia is thus replaced by the hexamethylenamine, which is a white powder very soluble in water and in alcohol, non-volatile, neutral, and which is neither an irritant nor a caustic.

If instead of existing free the ammonia be combined with an organic acid, such as acetic, malic, lactic, or citric acid, the same reaction occurs, setting free the acid. For instance, with acetate of ammonia the action may be thus expressed: 6 molecules of formol + 4 molecules of ammonium acetate = 1 molecule of acetate of hexamethylenamine + 3 molecules of acetic acid + 6 molecules of water.

One of us has made use of this reaction in successfully administering spirit of mindererus as an antidote in a case of poisoning by formol.²

And if instead of ammonia we have to do with putrid bases, free or combined, the same thing happens; there is always a combination with the formol, a resulting neutralization of the ammonia base, and a distinct transformation into products more condensed, inodorous, non-volatile, and deprived of all irritating or caustic action.

It must be well noted that up to now the question has not been as to the microbicide action of formol; the only effect considered is a purely chemical one of changing volatile and fetid ammoniacal derivatives into more condensed, neutral, fixed, and odorless products of a constitution analogous to hexamethylenamine, although having more complicated formulæ.

This is not all, for the products of disintegration of the pulp

¹ Le fermol géranie en thérapeutique dentaire, par G. de Marion et C. André. Compte-rendu du Congrès dentaire de Paris, Octobre, 1897.

² Journal de pharmacie et de chimie, July 1, 1899.

are not formed only of ammoniacal derivatives; there are fatty acids besides, arising from the splitting up of albuminous substances and which give that peculiar soft viscous consistence to the contents of the canals; lastly, there are gaseous products, in small quantity, certainly, principally formed of sulphuretted hydrogen and carburetted hydrogen.

Practically speaking, these fatty acids seem to have no distinctive noxious influence, since they are non-volatile and their chemical energy is very feeble; but we think that by the viscous consistence which they render to the pulp residue they can, by obstructing the microscopic opening of the dentinal canals, oppose a barrier to the diffusion of formol and delay its action. What confirms us in this opinion is the much greater rapidity of the disinfecting action of formol since we employed it in an alcoholic solution the same strength as the aqueous ones.

We may recall, indeed, that the solution we have employed since October, 1897, under the name of formol-geranium has the following composition:

Formic aldehyde.....	40 parts.
Essence of geranium, redistilled.....	20 parts.
Alcohol, 80 degrees.....	40 parts.

That is to say, that our geranium formic liquid has a strength of formic aldehyde as great as that of the commercial formols and contains a fifth of its weight of pure essence of geranium.

Now, alcohol and essence of geranium which separately have a very marked solvent action upon fatty acids co-operate in a very solvent manner by their association in the general act of disinfection in disintegrating and dissolving the viscous stuff which lines the root walls and obstructs the openings of the dentinal canals. Besides, alcohol by its own diffusibility in moist places helps the diffusion of formol in the fluids of the dentine.

There remain the gaseous products and principally sulphuretted hydrogen and formene, upon which our liquid has no chemical action of absorption. But these products are in small quantities, for they are set free as fast as they are formed. Alcohol, however, and the essence of geranium, which in a general way feebly dissolve gaseous bodies, can facilitate their departure by mixing with the fluids of the tooth.

Now that we have seen how the principal constituents of our

combination help to produce perfect disinfection of the root walls and the dentine, it remains to speak of their sterilizing action.

When the destruction of the putrid products is obtained, and only at this moment, the antiseptic work begins. The formol, the diffusion of which is very rapid in the conditions of the spot where it is placed, and the essence of geranium itself, helped by the alcohol, penetrate into the canalicules and destroy all the pathogenic germs. We will not insist upon these questions of diffusibility, no more than upon the considerable antiseptic powers of formol and essence of geranium, antiseptic powers much superior to the necessity caused by the germs. We have established elsewhere these important points, and they are too well known now to require repetition.

The time has come to say something of the methods to which we alluded above.

If one well imbued with this idea that the antiseptic action of formol is subordinate and subsequent to its disinfectant action, that the one can only happen when the other is achieved; if, moreover, one recollects that the disinfecting effect of formol is (according to the reactions we have stated) proportionate to the quantity used, it becomes unnecessary to use any other argument to justify the use of a large dose of formol in dental dressings. We must then repudiate every formulæ in which a weak dose of formol appears under the vain underestimated excuse of its great antiseptic power; as for us, we have given to our solution its minimum strength.

After weak solutions of formol there is another form under which it has been desired to use it in dental therapeutics. We wish to refer to powders or pastes containing formol in a nascent state (?).

We have analyzed a preparation of this kind; it contained oxide of zinc, burnt alum, anhydrous sulphate of lime, eugenol, and an infinitesimal quantity of trioxymethylene. According to the instructions which accompanied it this powder should be mixed into a paste with a liquid which was glycerin, and used as a unique application to make the most complete filling possible in a cavity under a permanent stopping. Experience has shown a short time afterwards the inadequacy of this mode of treatment.

We do not know if the owners of this powder attribute its virtues to formol; for our part we are sure that it does not inter-

vene, because of its insignificant proportion and its immediate absorption by the putrid products largely in excess. It must, however, be recognized that there was a relative success, and that for some time it caused an arrest in the progress of caries.

The explanation of this fact seems easy to us when we remember the dehydrating qualities of sulphate of lime and burnt alum. It probably happens that these powders absorb by degrees the water contained in the dentine, and as putrid fermentation requires the presence of water, there was arrest of this fermentation and a relative cessation of the morbid phenomena. But there was only an arrest and not the destruction of germs nor disinfection, and when, by a mechanism that we do not inquire into the dehydrating properties of the powders were satisfied and moisture reappeared in the dentine, fermentation recommenced and with it troublesome symptoms.

Nothing like this occurs with our method applied in the way we have several times described already, and which we have by successive steps brought to perfection. Thus, whilst at first we were obliged to use six or eight dressings for a large tooth deeply infected, we have reduced this figure by fifty per cent. Then the interval between two dressings which we fixed at two days has been brought down to twenty-four hours by the use of alcohol as the vehicle for the formic aldehyde and essence of geranium, and again it may be said that this interval much surpasses the necessary time, and could be reduced by some hours if the necessity of proceeding quickly should occur in practice.

Finally, let us recall what we said in our first communication with regard to the cleaning of canals; this cleaning is not an indispensable condition, and if in consequence of irregular conformation the ends of the roots cannot be reached and cleansed, formol modifies the pulp *débris* in such a way as to render them incapable of producing a later infection.

We have not introduced any modification of our method during the last two years. We may briefly say that it consists in making dressings at intervals of twenty-four hours until the last one taken out shows not the slightest trace of fetor, but on the contrary preserves in absolute purity the smell of the geranium. For these dressings strands dipped in the formol-geranium are introduced into the canals and pulp-chamber; the whole is covered in by gutta-percha.

CONCLUSIONS.

Let us sum up in a few lines what we have just said and what we have said in the former communications upon the use of formol in dental therapeutics.

Geranium-formol realizes as exactly as is possible the recognized theoretical conditions for the treatment of teeth with dead pulps.

1. It is the most powerful disinfectant known. It destroys the products of pulp fermentation, combining with and neutralizing them. This effect is shown by the complete and definite deodorization of the cavity after two or three dressings.

2. Its antiseptic power is superior to that of sublimate.

3. It is extremely diffusible in moist places. By means of this valuable property it acts not only on the root walls up to the apex, but even in the dentinal canalicules as far as the periphery of the tooth.

4. When geranium-formol is placed experimentally in sufficient quantity among putrid products it deodorizes them instantly. This experience shows that dressings may be made with as short intervals as may be desired, one hour if the need for rapidity occurs in practice; generally these dressings are applied on several consecutive days.

5. Geranium-formol does not in any way injure the hard tissues of the tooth, and does not set up any troublesome condition (periostitis) in the membrane.

6. Geranium-formol shows the advantage of a lasting result as compared with absorbent and drying powders. These only act by causing a more or less perfect desiccation of the tooth, but this desiccation is only temporary, and when the powders become hydrated pulp fermentation recommences with the train of symptoms which it excites.—*British Journal of Dental Science.*

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of The New York Institute of Stomatology was held Tuesday evening, October 2, 1900, at the office of Dr. S. E. Davenport, 51 West Forty-seventh Street, Dr. C. O. Kimball, of the Executive Committee, in the chair.

The minutes of the previous meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Dr. H. S. Bascom read a paper entitled "Case of Irregularity of Superior Cuspid."

(For Dr. Bascom's paper, see page 17.)

Dr. Kimball.—It is very unsatisfactory to get hold of a piece of work and yet be obliged to leave it unfinished, and I think our sympathies and hopes are all with Dr. Bascom that he will succeed in completing the work he has so well commenced.

Will you allow me to bring to your attention a case of my own which this suggests? I have the advantage of Dr. Bascom, however, in that my case is completed, and I have my patient here to show. The history is a simple one. Nos. 1 and 2 show the models of the mouth as it came to me. The young man was nearly eighteen years old. The lower arch was in good shape. The upper jaw was much twisted, so that the arch was not only crowded, but with nearly a reversed curve on one side. No trace whatever of the right upper permanent canine; the temporary canine was still in its place.

A careful examination of the mouth, as will appear on the model, showed a slight prominence (indicated by a blue pencil mark on the model) in the roof of the mouth below the lateral incisor. On feeling high up outside, I imagined that I could locate the tip of the root of the tooth as it lay embedded in the jaw. I have indicated by blue pencil where the point of the crown and the tip end of the tooth seemed to be. It was so high up that it was a doubtful problem whether the tooth was there or not. After consultation with various friends I made an exploratory incision, and found that I was right. The tooth was there.

The tooth was left alone the first summer, the time being spent in broadening the greatly contracted arch as a preliminary operation. In the fall of 1899 the prominence on the inside of the mouth had become a little more marked than was the condition on the 5th of November, 1898.

After broadening the arch the first thing to be done was to spread the teeth apart on the right side by means of wedges, to allow the tooth space to come down in place. We wedged between the bicuspid and the temporary canine, using the latter simply as a block. Having space, we made a clean incision to the tooth and packed the gum back till it healed, leaving a pit with the point of the canine at the bottom. I then made a little catch at the corner of the tooth and put on this appliance No. 3, a Jackson plate, with a little spring with a sharp point to catch the tip of the tooth and draw it into position. In the course of three months that had worked right out, and we have it in this shape where the tooth begins to show here in very nearly its proper position. The next mould is missing. It shows the tooth fully brought down, but twisted. A band was fitted to the tooth and a spring attached to the plate, hooking into a little eye on the band. During the following season the other teeth were straightened. This model shows the position of affairs as it is now.

I have asked the young gentleman to come here this evening (showing patient). He still wears the retaining plate with the spring hooked to the band; the tooth has been twisted nearly one-quarter of a turn.

The date of commencement was in June, 1898. We spent the first summer in simply broadening the arch, the winter in getting the tooth out into position, the spring in twisting it, the past summer in regulating the teeth.

Dr. S. E. Davenport.—Dr. William H. Jones, of Northampton, Mass., has just sent me several mouth-mirrors, recently designed by him, with the request that they be exhibited to the Institute. He calls them "Jones sterilizable mouth-mirrors," as they can be put in boiling water without injury, the mirror being of highly polished metal instead of glass. They are screwed into a simple aluminum handle and are interchangeable. They are of several shapes; some magnify and some are plain.

Dr. Jones does not intend to patent the mirrors, I understand, but they will probably be on the market in due time should there

be a demand for them. He does not claim that they possess any special advantage over glass mirrors, except that they can be sterilized without injury and are non-breakable.

Dr. Kimball.—Dr. A. F. Davenport, of North Adams, Mass., will now speak to us on “Stray Thoughts on Dental Hygiene.”

(For Dr. Davenport’s paper, see page 22.)

Dr. E. H. Raymond.—The subject that has been presented to us this evening is one that interests us all. Our first duty in treating diseases of the mouth is to put the mouth in a thoroughly aseptic condition. If we can counteract the solvent action of acids and destroy micro-organisms, normality can be restored in the oral cavity. To keep it so is the problem. Although this is a progressive age, and we have at command many remedial agents that patients can use, it is a difficult thing to get them to help themselves with anything except a tooth-brush. They are slow to adopt other prophylactic measures. How often, after we have toiled to put their mouths in proper condition, and given careful instructions, have we seen them return in a few months and find that no effort on their part has been made to help themselves except to brush the labial surfaces of their teeth.

It is my custom to prescribe hydrogen dioxide and milk of magnesia whenever I see any tendency to pyorrhœa or cervical decay. I believe that a three per cent. solution of hydrogen dioxide (aqueous), used daily, to be the best and safest preparation that a patient can use for all infectious conditions of the mouth. It is a good antiseptic and free from unpleasant taste. As an antacid I prefer the milk of magnesia. This should be freely used just before retiring, especially around the necks of the teeth.

Let us remember that however vigilant we may be during the daytime, the “night cometh” when acids get in their solvent work and the microbe is ever busy in the process of demolition.

Dr. S. E. Davenport.—Dr. A. F. Davenport’s paper bears pertinently upon many of the causes of dental caries and outlines good ideas, which, if followed, would result in the prevention of much tooth destruction.

For some years I have taken the position, in conversation with my patients, that the teeth of a person in good health will be almost free from decay if food is not allowed to remain between and about them. This freedom from putrefying material can be gained only by the thorough and scientific use of the brush and floss silk after

each meal at least, and the thorough disinfection of all contiguous mucous surfaces.

A considerable part of a dentist's duty is the instruction of patients in the proper use of the brush and silk, not only that the entire tooth surface may be polished three or four times a day, but that the gum be thoroughly massaged as well,—a most important point,—and the brush so directed that recession of the gums will be prevented rather than encouraged.

Dr. J. F. P. Hodson.—I do not find so much difficulty in having my patients brush their teeth as in having them use the silk floss. I am continually saying to them that if they are going to give up either the use of the silk floss or the brush, by all means give up the brush. The constant friction of the lips, tongue, and cheeks and the flow of saliva tend to cleanse the surface of the teeth, while the action of the brush tends to sweep the deposits in between the teeth, where decay is most apt to occur, the place which needs the most care and receives the least. In the use of the brush, however, I am careful to suggest that they brush off the tongue as well as the teeth. It seems to me very foolish to take so great care to brush the teeth thoroughly and leave a very dirty tongue to immediately soil them again. With the many aids we have now as compared to what we used to, it would seem that we ought to be showing good results from our constant teachings.

I can hardly agree with one of the speakers in regard to milk of magnesia. I have been disappointed that it would not do the work I hoped it would to render the mouth antacid. I did not find that it did so. I have thought perhaps the glycerin in it gave an acid reaction. I returned to my precipitated chalk, and urge my patients to rub it upon the gums and between the teeth just before they retire at night.

Dr. L. C. Leroy.—I think that Dr. Davenport will agree that the key-note of much of our trouble lies in the fact that we have to go farther back than attention to the teeth, and that we must adopt positive measures.

My experience with milk of magnesia, applied externally, has not been as efficacious as it should have been, but when administered as an internal remedy it has acted much better.

I have in mind a patient, a young man, who had serious erosion of the lingual surface of the incisors, where the lower incisors came in contact with the upper. I feared very serious results for

the young man's teeth. Internal use of milk of magnesia was prescribed, taking a teaspoonful at night, permitting the precipitate to form upon the teeth before swallowing. I know of no other reason why the erosion should have ceased, but it did so, which has inclined me to think that if we would go farther than dentists usually go, putting our patients in good physical condition generally, and bringing into effect medical skill, we would see far better results. If one feels that he is not competent to prescribe generally, he should refer patients to their family physician. There are many cases which might require general medical treatment; in pyorrhœa, for example.

Dr. Davenport seemed to lay particular stress upon the instruction in schools in relation to the care of the mouth. That I think is paramount. The doctor asked what has been done in New York City. I think that there has been a course of lectures instituted in our public schools and some of our high schools. A few men—those who lecture in the schools—make it a practice to examine some mouths in the districts in which they reside. We are in hopes that some good will result in the future, but I suppose that we must be content with what we have so long as the majority of our profession do not care to put their shoulders to the wheel and give their services gratuitously for the care of the suffering poor.

Dr. C. F. Allan.—The able essay that has just been read is one that must impress itself favorably on every one present, for the subject treated is of the first importance. Prophylaxis should be our highest aim, but, following the argument of the essayist, I cannot see how, except in the most general way, the care of the teeth can be taught in the public schools. One patient comes to the dentist with teeth irregular in arrangement and with mucus so thick that it can be strung out by the yard. Now, that patient requires every aid available for the proper sanitation of his mouth; while another patient with teeth in perfect arrangement and secretions thin and limpid, with the gums hard and practically no tendency to pyorrhœa, can keep his teeth in good order with the minimum amount of attention, none at all almost as compared with the case first mentioned.

The dentist who has these individual cases before him can instruct such patients intelligently how to look after their teeth, but I do not see how the special attention necessary can be indicated from the rostrum of a school-room. The main thing is that the

teeth must be kept clean, and I impress upon my patients that it lies with them to see that they are kept clean, and to know when they are well cleansed, just as they are to know when their hands and faces are clean,—by examination. Of course it will have to be done with the aid of a mirror, possibly a mouth-mirror, but they must actually *see* that their teeth are clean.

When the patients are in the chair call their attention to the purple color of the gum around a lower cuspid, and tell them what it indicates, warn them that free bleeding of the gums, as a rule, indicates pyorrhœal conditions that could have been prevented, and so impress upon them the proper look of a healthy and cleanly mouth that, examining it before a glass, they cannot be mistaken. A hard and fast rule that shall tell all people how to take care of their teeth does not exist and cannot exist.

Dr. Kimball.—It would seem as if this subject were spoken of so many times that it would be quite exhausted, but we know that it is not. It is always fresh in our minds. I have been surprised to hear people say they cleaned their teeth once a day, and on asking them, "When do you do it?" the reply would often be, "Before breakfast." "Well," I used to say, using the same illustration that Dr. Davenport has spoken of, "suppose you were in the habit of going among your plants, would you be satisfied if you washed your hands once a day, and that before you potted your plants?" bringing up the point that Dr. Davenport has,—to clean our teeth when they are soiled, and to keep them clean, that is all. There we have the hygiene in a nutshell.

Dr. A. F. Davenport.—I have noticed among most of my patients that the injury has been done largely before I saw the patient. My idea is that if we could by some means get the children to form the habit of caring for their teeth early it would be a great advantage to them as well as to the dentists. My idea in having the habit of caring for the mouth and teeth established in the schools is to reach a class that we seldom see, and by so doing to accomplish as much good to that class as possible.

Dr. Kimball.—We will next listen to Dr. T. W. Onderdonk, who will describe his treatment of unfilled pulp-canals.

(For Dr. Onderdonk's paper, see page 20.)

Dr. F. Milton Smith.—I have listened with a great deal of interest to Dr. Onderdonk. I could not help thinking, while he was reading, that if I could write and get to the point as promptly,

and sit down, I should be a vast improvement on myself. If there is but one point out of six in which Dr. Onderdonk differs from me, he agrees with me better than my friends usually do. They usually think me nine-tenths wrong and one-tenth right. If I am getting to be five-sixths right, I am making an improvement.

I think I said, in the paper referred to, "When I get it to an aseptic condition, I immediately fill the root." If I understand the doctor aright, he thinks there may be some question as to when I got there, and I suppose there are many times when I have failed in getting there. I have not a bacteriologist in my office to see when the root is ready to fill. If I had I might ask him when it was time. Thus far, after having followed the four or five conditions laid down in the paper, I have almost invariably found that the filling has not required removal. When the doctor was reading his paper I thought of a confession to make. In reading my paper I stated that I did not believe that in the twelve or fourteen years I had practised the method I had lost three teeth. Not two weeks after I had read that paper I had a young lady patient in whose tooth some one had kindly used arsenic. I treated and filled it, but the suffering was so intense that I sent her to Dr. Hasbrook, who extracted the tooth. I had requested her to secure the tooth for me. When I received it I cut off the crown from the root, and felt carefully for the filling, and found that the root was unfilled at least one-third from the apex. If that goes to prove anything, it is that trouble is more likely to ensue if the root is not well filled.

Dr. S. E. Davenport.—Dr. Onderdonk's paper is a practical statement of facts from experience, and we plainly see that he is accustomed to the filling of roots. He speaks feelingly, and I judge that there have been some exciting times in his practice which have taught him when *not* to fill roots at the first sitting.

While the subject chosen by Dr. Onderdonk is a very old one, there is still much to be learned about it, and it is well for us all to hear a clearly defined paper like this, as our thoughts are thereby turned in the right direction.

Dr. G. S. Allan.—The philosophy of the management of so-called dead teeth is simple enough, but working out the details and putting into practice the laws and principles that govern the management is quite another matter. A large knowledge of science in general is necessary to enable one to work intelligently, and an

equal amount of mechanical skill and dexterity to put them into practice.

The subject easily divides itself into two parts,—(1) the preparation of the pulp-canal, and (2) the closing up and filling of the same. The two parts are of equal importance, but not necessarily of equal completeness of detail in practice. Were it so, our list of failures would largely exceed our successes. Complete sterilization of the canal is most essential, but a perfect root-filling—one closing the foramen with exactness, not going beyond and leaving no vacant spaces in the canal—may be, and frequently is, dispensed with and yet success crown one's efforts.

The ideal operation is the one that destroys all inflammatory pus-forming germs in the canals and the parts adjacent to the foramen and then prevents their obtaining a future lodgement from without. No amount of skill or forethought can prevail against the germs that wander through the system and do their evil work whenever and wherever they obtain a lodgement in a favorable soil. Fortunately this latter danger does not often worry us or give suffering patients a cause for complaint. There was a time when I fairly dreaded to see a case where any of the temporary teeth required the removal of the pulp and their treatment. Now they do not disturb me. Formerly I thought it necessary to not only remove the dead pulp, but to fill the empty roots. I had been educated to believe that radical root-filling was a *sine qua non*, and so endeavored to put my practice on an equal footing with both sets of teeth. Now that I am able to see more clearly what must and what need not be done, my dread has departed and my success is more certain.

Thought and study of results and causes have taught me that it is not only safe to leave the roots of the temporary teeth open, but that it is the wisest and safest practice, and carrying out the principles involved to their logical conclusion. I now do not hesitate to leave undone that which I cannot do, and leave unfilled, in part, roots where from their nature and shape I cannot attain the ideal thing. The conclusion is that a root sterilized in all its parts is practically safe even if it is not up to the highest standard so far as the filling is concerned. A professional friend in a neighboring city once told me that he seldom filled any roots,—did not think it necessary,—and yet he was an able man, had a large practice, and courted success with high standards.

How often have we all seen cases where the pulp has died and been allowed to remain in the pulp-chamber and roots for years and given no pain or trouble. So long as germs were excluded they would remain quiet. The dead pulp, though an excellent soil for the propagation of germs, was harmless till they were introduced.

Nothing that I have so far said must be interpreted to mean that I do not advocate thorough root-filling. I most certainly do, but I sadly recognize my limitations and am ready to stop when I have done my best, and still hope for a fair amount of success though I am compelled to stop short of the ideal. Therefore it is that I say, look to the removal of the dead pulp and the thorough sterilization of the roots first, and be thankful that so much can be done to a finish.

Hydrogen dioxide is by far the most satisfactory germicide in many ways, but the free oxygen liberated is apt by its mechanical pressure to prove irritating and give much pain. In potassium permanganate we have an excellent substitute and one free from the objectionable features of the hydrogen dioxide.

It may be well to state in brief the real value of root-filling. As a matter of fact, whether the operator fill the root-canal or not, the space once occupied by the pulp will be filled by something. It cannot remain vacant. In some way organic matter will find an entrance into the open root, and lifeless organic matter at that, and therefore just the right soil for the pathogenic germs to flourish in. The rationale of root-filling, then, is not so much that the germs may be kept out of the roots as that the food on which they grow may be kept away from them. We plan to render them harmless by starving them. Once started growing, they make their own pabulum by destroying some of the adjacent tissue. No matter how disproportionate a part of the apical portion of the root-canal remains unfilled, if any portion remains outside the life forces a focus for the active work of the germs is ready at hand. The germs we fear are those that obtain an entrance to the pulp-chamber from the oral cavity.

Dr. Hodson.—There are two or three points of suggestion which I have to offer just here, and, though separate in themselves, are all centred about the law of capillarity, a law of which I take advantage in so many directions and find so valuable that I had purposed making a separate paper on the subject. In the first

place, I make sure of never pushing the septic contents of root-canals through the foramen, by alternately filling them with water and antiseptics and drawing them down and out again until the canal is clean. This I do by means of bibulous paper root-points, which I conceived for this purpose and which I gave to the profession in a paper read before the Odontological Society some twenty years ago. The idea being that while the paper point will penetrate to the full depth of a root-canal nearly as well as a broach, it will pull down the liquid contents and not push them ahead, like cotton on a broach.

Similarly, after the root-canals have been brought into a proper condition to fill, I use this same capillarity to even better purpose; so much so, indeed, that I am most confident that my canal-filling reaches wherever the end of the broach has gone. The root having been made perfectly dry (and it is astonishing how dry the canal can be made by letting the finely twisted paper points reaching to the end of the root lie half a minute before removing, then following with another, etc.), flood the canal with chloroform to wet the porous dentine with the menstruum of the chloro-percha which is to follow; then having wetted the whole surface of a very fine broach with thin chloro-percha, place it quickly in the canal to the end and as quickly touch it at the orifice of the canal with a drop of thin chloro-percha,—one can see it jump. Following the chloro-percha on the broach, a tiny working of the broach around and up and down will make assurance doubly sure of its adhesion to the walls. Then the solid and cold gutta-percha canal point, having been previously attached to the end of a root-canal plugger, is very carefully pointed at the entrance and quickly and gently carried snugly home. By this procedure the end of the gutta-percha point is never turned, but goes as a solid point practically to the end of the root, the preceding chloro-percha but serving to plug up the mouths of the tubuli, following as it does the penetrative soaking of the dentine with chloroform and making perfect the fitting of the solid gutta-percha point, the real canal filling.

In fine, my aim and expectation is to have at the end of the operation not much more chloro-percha remaining in my root than there would be of glue in a properly glued wooden joint.

Dr. G. S. Allan.—I would take exception to the term “capillary attraction” used by Dr. Hodson. Capillary attraction, of itself,

could not to any extent draw a fluid into a tube, however fine, that was closed at one end.

Dr. Hodson.—I only offer a method for *filling* whenever the root is ready, a method I cannot but feel makes possible, even sure, the filling of roots to their ends with gutta-percha. As to tortuous roots, if I were only as certain, though employing every known means as I do,—sulphuric acid for opening and enlarging the canals and burning out the organic contents, the employment of germicides and disinfectants, hot air, etc.,—I say, if I were only as certain of getting these tortuous canals clean as I am of perfectly filling them by means of this capillary attraction acting along the finely coated broach, reaching loosely to the end of the root, I should feel very comfortable. I may add that this method applied to oxychloride of zinc is equally effective, substituting the chloride of zinc instead of chloroform for the preliminary wetting of the interior of the root, and is, indeed, the material with which I years ago first used the method. Dr. Allan remarks that capillary attraction does not act in a tube unless both ends are open. Quite true, but I do not use the tube; I use the coated broach laid along inside the tube (the root-canal). Granted that the broach is sufficiently fine and so thinly coated as not to fit tightly in this tube, and the interior surface being wetted with the menstruum of the filling-material, capillary attraction will surely carry such material to wherever the end of the broach may reach. Once the inside is thinly coated, it is followed by the solid gutta-percha, as before mentioned. That, I thought, Dr. Allan understood.

Dr. G. S. Allan.—Dr. Hodson's explanation does not prove his point to my mind; in fact, disproves it. The doctor uses a mechanical force to push his fluid into the root and fill it and close the foramen, and capillary attraction plays only a slight part in the operation. The walls of the pulp-canal are capable of being wetted,—if I may use the term,—and the doctor, by means of his broach, or broach wrapped with a fibre or so of cotton, brings the fluid into direct contact with the walls of the root and at the same time forces the contained air out. Capillary attraction to be operative in such a case requires a very fine tube and open at both ends. The chloro-percha will go just as far and fill just as fine and crooked a canal as the broach carries it, and practically no farther. Of course, you will understand that the chloro-percha brought—pressed—into contact with the walls of the pulp-canal clings to

them by the law of capillary attraction, but that part of Dr. Hodson's statement has not been questioned.

Dr. Kasson C. Gibson.—It is claimed that it is necessary to thoroughly sterilize the roots of septic teeth before filling. I do not believe a tooth can be thoroughly sterilized with antiseptics. What assurance have you that a tooth can be sterilized? I use Evans's root dryer as well as antiseptics, relying more on heat. When the tooth is favorable for filling, as a rule, I fill the root-canal with zinc oxychloride. In the treatment of abscessed teeth I have not always met with success. From a surgical stand-point a large percentage of abscessed teeth should not be treated, but extracted.

Dr. Onderdonk.—I was in hopes, Mr. President, that the discussion would follow Dr. Gibson's suggestions. The points I wished brought forward were,—(1) the aseptic condition, how secured and how maintained; (2) what is the best permanent antiseptic root-filling?

How are we to know when the root is thoroughly sterilized? I suggested making cultures and the use of the microscope as possible means to that end. I wish some one more conversant had said something on this subject.

There are three principal sources of infection which should be taken into consideration,—the cavity in the tooth, the apical foramen, and the dentinal tubuli. The closing of these last I believe to be the weakest point in most filling-materials.

If chloro-percha is used, it will shrink in proportion to the bulk of chloroform in the solution. It will not adhere to the tooth-substance nor will it close the foramen. Oxychloride of zinc ceases to be an antiseptic on crystallization, and is soluble, thereby admitting infection at the apical foramen.

The method I suggested in the paper—*i.e.*, iodoform in ether, a varnish of rosin in chloroform, and gutta-percha points—seems to me to represent the most scientific root-filling. By this method, having the cavity rendered antiseptic by hot air, hot points, etc., the iodoform in ether is introduced, and the porous tooth-substance must absorb some of the iodoform. This is sealed in by the rosin varnish. The apical foramen is closed by the gutta-percha points with iodoform ahead of them, and the points solidly fill the canal. The cavity in the tooth is then closed with a suitable filling and the three sources of infection are taken care of.

Dr. A. L. Swift.—Referring to Dr. Onderdonk's objection to oxychloride as a root-filling, I have filled roots for more than fifteen years almost exclusively with oxychloride, and am fully convinced that when used at the proper consistency zinc chloride finds its way into the tubuli, especially when only non-coagulants have been used, and consequently all antiseptic action does not cease as soon as the crystallization takes place.

Dr. Leroy.—I wish to call attention to the remark that gutta-percha thoroughly dissolved in chloroform (chloro-percha) and placed in a root-canal in time occupies less space than it did at first, which phenomenon we know to be due to shrinkage. I would like to say that gutta-percha dissolved in eucalyptus oil (eucalypto-percha) does not contract but remains the same, the eucalyptus oil even penetrating into the dentinal tubuli. I have found that to be the best material, and have used it for a long time (seven years or so).

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

ACADEMY OF STOMATOLOGY.

A REGULAR monthly meeting of the Academy of Stomatology of Philadelphia was held at the rooms of the Academy, 1731 Chestnut Street, on the evening of June 26, 1900, the President, Dr. Lippincott, in the chair.

A paper entitled "Prophylaxis in Dentistry" was read by Dr. D. D. Smith, of Philadelphia.

(For Dr. Smith's paper, see Vol. XXI., page 805.)

Before the reading of the paper a recess was declared, during which Dr. Smith exhibited a number of patients whose mouths exemplified his ideas of prophylaxis.

DISCUSSION.

Dr. James Truman.—I am heartily in accord with the whole paper. It seems to me that dentistry is drifting gradually in the direction of prophylaxis. There is no doubt but that in the future patients will be required to come regularly to the office to have their

teeth attended to. I do not know that there has been anything new presented in so far as cleansing the teeth is concerned, but that dentists have been careless in training their patients, and that they should recall them once in every month or two to have their teeth thoroughly gone over, has been brought out and insisted upon by the essayist. I have not the least doubt that much pyorrhœa, gingivitis, and other disagreeable conditions that we have to contend with would be obviated by this procedure. The younger progressive members of the profession had better work in the direction of prophylaxis, for it is certain to be of increasing importance. Whether it will stop decay or not time alone will tell.

Dr. Darby.—Perhaps I cannot say anything that would be more valuable and convincing than to testify to what I saw a few weeks ago in Dr. Smith's office. He very kindly and courteously invited me there, and had present about a dozen of his patients to illustrate this method of treatment, and when I tell you it was a revelation and an inspiration to me, I only express about half of what I then felt and feel to-night. I have never seen teeth so absolutely clean and polished upon every surface as those that I saw there. I do not recall a single instance of a mouth with any deposit, with the exception of a young man who smoked pretty constantly. The teeth seemed to present a peculiar polished surface, which I could only liken to that of a ball polished on a lathe. The whole character of the tooth seemed changed. You have all seen in the mouths of some of your patients, where the teeth have been the best, a peculiar polished look which you have not seen in the mouth of your average patient, a peculiar ivory-like look of hardness, if I may so express it, throughout the whole enamel. I saw that in young girls, in middle-aged persons, and in two quite advanced in life in Dr. Smith's office; and when I went back to my own practice it made me very careful about the methods of my patients, and I preached to them as I never preached before. I have said more discourteous things than ever before. I have said to Harry or Jim, "Your teeth are dirty," while they might not have been worse than they ever were at any other time. I have said, "Your teeth are not clean; you do not take care of your teeth." Since I saw those patients I have taken better care of my own teeth, and the influence on my patients, indirectly through me, has been for good.

When Dr. Smith says he prevents decay, I believe he does. I

believe that if we remove the bacteria from the surface of the teeth by polishing, as he does, the teeth will not decay. There was only one point I could not understand, and that was how his patients could have teeth so clean upon the proximal, labial, and lingual surfaces without the use of floss silk; but their teeth were free from deposit, *débris*, or anything else, and the gums seemed to cling to the teeth as though they were part of them.

I simply want to indorse most heartily what I saw myself, and if the recommendations can be carried out *in toto* teeth will not decay and there will be very little use for the dentist, except to polish teeth.

Dr. Kirk.—I am very glad to add my few words of testimony to what Dr. Darby has already outlined to you of the wonderful character of the exhibit made by Dr. Smith in the mouths of his patients which he so kindly gave us an opportunity of examining. I do not think that I can add anything to what Dr. Darby has said. He has described the general principles of these methods, the peculiar appearance of the polished surface of the teeth, the character of the structure of the tooth, and the character of the mucous membrane and the gum. The mouth was free from the irritating effects of the bacteria, and we know infection may manifest itself in a very great many ways.

The thing that strikes me most forcibly about what Dr. Smith has accomplished is this: He seems to be the only man who has actually accepted at full face value the statements and results of investigations of those who hold to the idea that caries of the teeth is the result of the environment of the teeth. Its cause is external to the teeth. It seems to me a very rational conclusion that if the carious process is produced by these bacteria the one way to avoid caries is to get rid of them. Certainly there could be no bacterial plaque form upon the surfaces of teeth that have been treated by this method of Dr. Smith. It seems to me that he has gotten down to the tooth-structure. There is none of that slippery, greasy appearance and feeling commonly found in the mouths of those who take only ordinarily good care of the teeth. What we call ordinarily good care is not sufficient to protect dentures from carious influences. It must be extraordinarily good care, such as has been shown. The combination of an appreciation of cause and the effective operation of correctives has produced results for Dr. Smith which he can offer as evidence of the success of his application.

I must confess that I am not wholly satisfied with the exhibit made by Dr. Smith in one particular. I think we should have the record of a longer period of test of this matter before we decide whether the particular methods he suggests are the best for the accomplishment of his purpose. He has shown the way out. He may, in the course of time modify his treatment very much. So long as we have bacteria on the teeth and the lack of resistance in the tooth-structure, so long will we have caries.

The principle is all right. It is a question whether the tooth-polishing, carried over years of time, may not produce some modification of structure, which would indicate that it would be better to modify this method by less abrasive powders or employ some other method. I do not say that it will be so, but only raise the question. It will probably be a long time before we come to the final judgment of the utility of this particular method. I have nothing but words of commendation and approval.

Dr. Darby.—I would be very glad if Dr. Smith would tell us what specific instructions he gives his patients after seeing them, or if he sees his patients every month.

Dr. Smith.—I give the patients no specific instructions beyond what I have always done, that is, to clean the teeth carefully with brush and tooth-powder, which, in so far as possible, I select, and with all the younger patients I insist on their using fine salt, once a week, as a dentifrice. There are others to whom I do not give any particular instructions. I do not ask them to silk out the teeth. I have heard patients say they take half an hour of an evening "silk" their teeth; instead of this, if a quill toothpick were used after each meal and the teeth carefully cleansed with brush and dentifrice once a day, it would be far better for the teeth. After the surface of the enamel has been polished two or three times, brushing is much more helpful to the teeth than could possibly be the case prior to their having been polished; in other words, a very little effort on the part of the patient will put the teeth in a good condition. I would be very glad for any suggestions from any source whatever that would assist in the betterment of methods; but after having used this method for six years on a few patients, and in general practice for two years, I believe the methods will not be greatly modified. I consider it an impossibility for any patient to take such care of the teeth as will keep them absolutely free from bacterial accumulations. It requires

outside interference, and that outside interference consists of an intelligent removal by the operator of the accumulations by the methods indicated.

Dr. Darby spoke of silking out between the teeth. It is an operation which nature never designed should be performed in the mouth at all; the teeth are placed in apposition, and all that is required is that the proximal surfaces shall be kept clean and polished. The uncultured colored people of the South, in their original condition of slavery, were compelled to eat bacon, pork, and cracked corn. You will find the teeth of the field-hands generally in good condition; they never silk out their teeth. Nature has placed teeth alongside of each other, and never designed that anything should go in between them. All surfaces of a tooth ought to be polished just as the occlusal surfaces are polished, by mastication. The patient cannot do this, the dentist has not done it, and the result has been, as you know, unlimited decay. I do not know that it will be necessary to continue this practice throughout life. I do know that it is absolutely essential that it should be done in early life, during the formative period, and unless it is done you will find, in every instance, a pathological condition of the child's mouth. It is the business, it seems to me, of the dentist to make good teeth, not by going back to the mother's breast and attempting to control the food of the child, but by preventing them from being contaminated by the external agencies which cause their decay. That, however, is not the only benefit derived from the polishing as advocated. The irritation which this process gives to the outside of the teeth causes positive stimulation of the pulp and the deposition in these teeth of better dentinal material, and this is where the chief benefit comes from the care of the teeth in childhood. You will say that they ought to get this in the masticating process. So they should to a degree; but with the present methods of preparing food, and the consequent lack of use of the teeth, they never get sufficient irritation from mastication to give that stimulus which causes the pulp to deposit a good constructive tooth-material. This irritation is supplied to some extent in brushing, and at the same time there is fulfilled the object of divesting the external surface of the teeth of those agents which cause their decay. I esteem this stimulus to better tooth-building the strongest point in connection with this practice. If there should be any modification, as suggested by Dr. Kirk, it will be a partial

abandonment of the process later on in life. I do not know that it will be necessary to continue it, but I do know this: I have yet to find the first case of a young adult, middle-aged, or old person, where the benefits accruing to the tooth have not been marked after even a few treatments. The life-forces of the tooth work, as the result of this treatment, to produce better tooth-material.

I wish to thank you, gentleman, for your courteous and very kind attention; on account of the extreme heat I must leave the subject with you for any further consideration that you choose to give to it. I now bid you good-night.

Dr. Cryer.—I would move a vote of thanks to Dr. Smith for his valuable paper and subsequent talk.

Adopted.

Dr. William Trueman.—In looking at the cases presented and listening to the doctor's remarks, I am impressed with the claims for what will take place within two or three months from a constant irritation, and question whether in the end it will not be disastrous. A case of pyorrhœa has been under my observation where I have shown that the usefulness of the teeth has been curtailed by that process. Had milder treatment been pursued and less attention paid to irritation, the teeth would have been in better condition. The best germicide we can use in the mouth, one that we can always depend on and one that can possibly do no harm, is perfectly healthy saliva. Dr. Kirk published a paper a little while ago, giving his observations at a deaf and dumb asylum. I think he probably lost sight of it when speaking. At the time it was published he gave the dietary of that institution. He brought out the fact that it was not the dietary alone, but the regular lives led that gave the inmates hard teeth. In that case a more healthy condition of the system was brought about. If we could induce in all persons a perfectly healthy condition, we would all die of old age. With the method of thoroughly cleansing the teeth by rubbing and scrubbing them to keep them free from deposits, it is a question whether we do not do more harm than good. There is a happy medium in all these things, and those who strike it derive better results. I think that in five years from now the doctor will think very differently from what he does now, but we are very thankful to him for bringing up the question, and while some may not accept it, some will, and experience will prove or disprove it.

Dr. James Truman.—I should like to add one more word. I do not exactly like Dr. Smith's idea of the contraindication of floss silk. I cannot understand why the silk passed between proximal surfaces is not the very best cleanser that can be used for these surfaces. Again, the so-called plaques have never been scientifically demonstrated to be acid producers, and yet we hear and talk of those matters as though the whole thing were settled. Those gentlemen who so determinedly insist that the bacteria in these plaques are acid producers had better read Goadby on that same point in the *British Journal of Dental Science*.

Dr. Roberts.—The argument which Dr. Smith advances, that nature did not intend silk to be used, can be applied to all other forms of cleansing teeth that he suggested. If nature did not intend that floss silk should be used, she did not intend that teeth should be brushed or that pumice-stone should be used. If you use the argument for one thing, why not for another analogous thing?

I think there is no germicide which can be used in the mouth which is liable to be held there sufficiently long to destroy the bacteria, and that while the germicide may not do any harm, it will not cleanse the teeth; neither will it prevent decay, unless there is other instrumentation with that, and the instrumentation is more valuable, in my opinion, than the germicide.

Dr. Jack.—I may state that my views are generally in accord with Dr. Smith's statement; that is, my experience has borne out the fact that just in proportion as I have been able to get young children or my young patients to take better care of the teeth have I been successful in securing a good condition. I remember the instance of one boy in my practice: he had a good many complications, and was eighteen years of age. I had cared for his teeth probably two or three times a year, each time carefully cleansing them myself, both within and without and between the teeth, and I endeavored to teach him how to care for his teeth. At last I trained him to take reasonably good care, and after a couple of interviews I found nothing to be done; at the last of such interviews he got up out of the chair with the expression, "It pays to take care of your teeth." I remember another instance of a young lad in whom I had filled a large number of proximal cavities in bicusps and molars, and upon whom I could not impress the necessity for keeping his teeth clean. He was about going to Eu-

rope at one time, and I put a large number of fillings in his teeth, some extending to the cervical margin. I stated to him the consequences caused by his own neglect, and that if he would take proper care of his teeth it would limit the caries. At the same time I put his mouth into good condition. He went to Europe, took the lesson to heart, and came back to me after two years of absence, and I could not find caries in his teeth. Whether that was partly due to better hygienic conditions, incident to his travels in Europe, I cannot answer. Certainly that was the result, and the boy has had since very little decay in the teeth. He has a brother, on the other hand, whose teeth were somewhat softer. I could never get him to take proper care, and he has been suffering considerably with proximal caries.

I examined at one time some years since the mouths of Indian girls who were at the Lincoln Institute, who had been brought from various parts of the Western reservations, from the borders of Canada down to New Mexico, and those Indian tribes who possessed the best teeth were the Sioux Indians. I may state here that one single cross of the white man on the middle and southern tribes of Indians always showed a marked increase of caries over the other Indians. In the first cross between the white man and Sioux, the open sulci were true; when it came to the second cross, caries began to appear. Some of the pure races belonging to New Mexico and other Southern races presented caries of the teeth, and in the real Indian, whereas the Sioux presented none. Here were conditions exactly alike in both cases,—the Southern Indian lived as the Northern Indian did. My only explanation is this: The Sioux, living in the higher northern latitudes, were subject to greater vicissitudes of climate, and also probably other conditions that led to the survival only of the high constitutional conditions, whereas the Southern Indians lived under better conditions, under better climate and less physical stress,—that is, of inherently different conditions,—and grew up to maturity. It certainly showed that the question of environment did not induce decay of the tooth, because we might infer that the habits of the Sioux were no different from the habits of the Southern Indians.

At some time or another I will present a tabulation before this society. I have meant to do it from time to time, but have waited until I have had an opportunity to examine a larger number of Indians, so as to make the matter more comprehensive and the

results more definite in the conclusions that might be taken from them.

Dr. Hickman.—I am disappointed that some one has not spoken of the white spots that will appear on the teeth, that Dr. Smith told us should be removed. I have several patients with white spots on the labial surface of the front teeth, and I would like to know if any one knows how to get rid of them, or if this method is certain to effect it.

Dr. Schamberg.—I am very sorry that this paper did not extend to the prophylactic treatment for the prevention of diseases affecting the soft and hard tissues, which are likely to follow certain diseases, inasmuch as prophylaxis in dentistry should include that form of treatment. I must say that I believe that prophylaxis after disease, such as measles, scarlet fever, small-pox, and diphtheria, is frequently neglected, and I take this opportunity of exhibiting a few photographs that I have of cases of gangrenous stomatitis, which, though it may seem far-fetched, I think is generally probably due to the fact that prophylaxis is not thoroughly practised in these cases. I may state that of these three cases of gangrenous stomatitis, every one of them followed measles. However, two of them were suffering or convalescing from other diseases. One was convalescing from measles; one had pneumonia after measles, and the other had diphtheria. The thought came to my mind of the relationship between the prophylaxis in this direction and the prophylaxis of the teeth, through a case that appeared at the surgical clinic of the Polyclinic Hospital for treatment, where we removed a necrosed area of bone, involving the two superior deciduous central incisors and the partially formed permanent central incisors. It simply shows the necessity for the use of germicidal agents in the mouth after such diseases as measles, scarlet fever, diphtheria, and small-pox. We know that measles is quite prevalent, even among the better classes, although small-pox is not so frequently found, and scarlet fever is of rather frequent occurrence. Practitioners fail to remember that the eruptions in this disease are frequently found in the mouth antedating the eruption in other parts of the body. I will pass around these photographs, one showing the condition as it started, and another showing it as it advanced. In gangrenous stomatitis the disease is fatal in perhaps eighty or ninety per cent. of cases, and therefore it shows that the only way to combat the disease is to prevent it, and not to attempt to treat

it after it has once begun its ravages, for unless you remove almost the entire part, just as you would in any other gangrenous area, you cannot hope to have any results whatever. The patients are usually so weakened by the condition that they succumb to the operation.

Adjourned.

OTTO E. INGLIS,
Editor Academy of Stomatology.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE thirty-third annual meeting and dinner of the American Academy of Dental Science was held at Young's Hotel, Boston, Mass., on Wednesday evening, November 14, at six o'clock, President V. C. Pond in the chair.

About thirty-five active Fellows were in attendance. The principal guests and speakers of the evening were Mr. George A. Littlefield, of Providence, R. I.; Rev. Charles J. Ketchum, assistant rector of St. Paul's Episcopal Church, Boston; and Mr. George Martin, supervisor of public schools in Boston.

Rarely has the Academy had the pleasure of listening to a more eloquent or interesting speaker at any of its annual gatherings than Mr. Littlefield proved himself to be. His address upon "American Citizenship" was a thoughtful and scholarly exposition of the subjective and collective characteristics of the ideal American of the present day, which, as he said, "it must be remembered, is a product of four hundred years of growth out of widely varied elements."

The speaker maintained that the first characteristic of American citizenship is based upon constitutional law, and that in the framing of our separate State constitutions, with such penalties as to compel their enforcement, and the interpretation and administration of these great charters, is to be found the chief historic differentiation of America from all other countries. Our forty-four State constitutions in writing all support and are each supported by the great key-stone of the written Constitution of the United States, each preserving perfect equipoise among the legis-

lative and judicial functions; and the touchstone of all these great documents is the perfect equality of all men under them, without the slightest hereditary or aristocratic distinction.

The value of the religious motive and of education in promoting the growth of American character and manhood was forcibly demonstrated, as well as the lessons and experiences which have come to us from the Spanish-American War, and which have brought our national ensign into the boundless respect of all nations abroad.

Mr. George Martin was next introduced, and, following along the line of thought of the previous speaker, dwelt upon the relation of education in the public schools to the work of the various professions, maintaining that it is the aim of the public school to enable every child, whatever his inheritance may be,—material, intellectual, or social,—to get the most possible out of life and to put the most possible into life; in other words, that the strongest and best foundation for a professional life of any kind is necessarily laid in our public schools.

The Rev. Mr. Ketchum spoke entertainingly and in a general way upon the similitudes and the diversities of the clerical and the dental professions.

Previous to the banquet the following-named officers were chosen for the ensuing year: President, Dr. V. C. Pond; Vice-President, Dr. Frederick Bradley; Recording Secretary, Dr. Frank Perrin; Corresponding Secretary, Dr. George H. Payne; Treasurer, Dr. William Y. Allen; Librarian, Dr. Herman G. Hichborn; Editor, Dr. Charles H. Taft.

Executive Committee.—Drs. Forrest G. Eddy, Thomas Fillebrown, and Stephen G. Stevens.

CHARLES H. TAFT, D.M.D.,
Editor American Academy of Dental Science.

Editorial.

THE TWENTIETH CENTURY.

1901. The sound seems significant of youth, infancy, the first year of life. The age of humanity, when the mother thinks of her wailing infant and the father wonders whether the horoscope of the life will be for the happiness of the child. The dentist thinks of the evolution of teeth and dentition.

The first year of a century is to the sentimental mind the reincarnation, as it were, the unfolding of a new life, but the practical man regards it as simply the recrudescence of all that has gone before.

We celebrate the years of our birth and make merry at each returning Christmas, and become saddened as each annual day brings to memory the departure of some loved one to join the immortals. Thus humanity is ever breathing a new inspiration and taking up the old burdens, waiting for the end it sees not.

The century, the nineteenth of the Christian era, closed with December, and a portion of the world began anew to dream dreams of the possible future that lies locked up in the unknown years that will mark another century upon the calendar of a world's development.

The prophet is not born that can tell what these years may bring forth for dentistry. The thought has been, heretofore, expressed on these pages that it might in the near future be lost as a distinct profession. It is possible that this may happen, but whether dentistry dies by name or not, stomatology will exist as long as teeth are necessary for mastication. The dentistry of the future may be known by another name, but those who follow it will still be laboring to save the teeth of the human race, and, failing in that, will still be inserting substitutes, crowns, bridges, and artificial dentures.

It requires no prophet to foretell that the mind of the future will become more and more intelligent regarding teeth, causes of decay, and the importance of proper sanitary measures to prevent destruction. It needs no keen foresight to know that a portion of

the general training of the future will be in the direction of prophylactic measures to insure health. The man of the last years of the twentieth century should be able to so care for himself that sickness should be something of a discredit, conveying the impression that there had been a lack of care, a want of cleanliness, and a disregard of the laws of life fairly well understood before the curtain is rung down on two thousand years.

The world hopes much for the incoming time. The past is secure in its triumphs. The present generation may rejoice in that it took part in all that made the nineteenth century glorious, but as the days drew to a close the thoughtful, altruistic mind could not but feel that this century had failed to make for a much higher civilization than that of the fifteenth. The wars and rumors of wars that have disgraced the declining months of this noble epoch are the lingering evidences of the brutality in human nature that seems to place far away the time when spears may be formed into pruning-hooks and swords into ploughshares.

While we thus face the first twelve months of another century, and may look forward hopefully for the further development of our loved profession, let us not forget that the skill obtained has been the result of a self-sacrificing effort on the part of many men. That if the eighteenth and nineteenth centuries made dentistry, to the twentieth belongs the responsibility of so completing the work that whether it lives under that name or not, it will still be known as a living fact in the life of all civilizations.

Let us then gird ourselves anew and resolve that whether our days be many in the land, or otherwise, we will never be drones in the busy hives of a world's activities. The responsibility of the future of dentistry belongs in part to every reader of this journal. It cannot be placed on some one else. The accountability comes directly home to you. There is much work to be accomplished. Your journal needs your best thought and your most earnest effort for its success. Your society needs your constant help. Your State organizations will suffer without your aid, and the National organization looks to you to give it your undivided allegiance. More than all this, the century demands of you that you will so conduct your professional life that it will be honorable before the world, and in that proportion will dignify your calling. The twentieth century demands this at your hands, and in so far as you fail to meet its requirements will you do your part to destroy the

results that were given to dentistry by those who worked and toiled and self-centred their lives that their profession might be respected among men.

THE BEGINNING OF A NEW VOLUME.

It is always of interest, in any avocation of life, when the period arrives to close the books of a year and to count the profit or loss in the work upon which any one may have been engaged.

The December number closed with this journal another year of work, a year of anxiety, of toilsome effort to give to the dental profession a journal that would be a true exponent of the best life in dentistry. Its success or failure in this direction has now passed into history, but that it has performed its full share of the labor given to each of us to do may be accepted, and credit be given, at least, for an honest and untiring effort to raise dentistry to a position worthy to rank with the older professions.

The INTERNATIONAL DENTAL JOURNAL has now been working under that name for some twelve years, nearly eleven of which have been under the present management. Prior to that time it was known as *The Independent Practitioner* and has now reached its twenty-second volume under both names. During these periods it has been supported by the most earnest men in dentistry. Their sacrifices need no record here, and possibly these may never be known, nor is it material that they should ever be considered.

To establish a journal in the face of an almost overwhelming apathy on the part of dentists to anything in the direction of developing a true professional spirit has required a persistent and courageous effort. The commercial side of dentistry has had the power that capital always gives, and while this journal has been to a remarkable degree successful, it has not and cannot attain to that position its founders hoped for while it must contend with this power, unless it receives the co-operation and continual sympathy of those who desire to see dentistry stand free from all entangling alliances.

It must be clear to all observers that the dental periodical literature of to-day in this country can never reach a true standard of independence while under the control of those not immediately

connected with dentistry as a profession. This statement means no reflection on those who are monthly sending out these journals as advertising periodicals. That the majority of the twenty-six thousand dentists of this country absorb their dental pabulum from this source is not to be questioned, with the result that the standard of thought is by no means as high as it should be.

It is not, however, the object of this writing to judge the character of our trade contemporaries, for they must stand or fall on their own merits, but to urge those who feel that dentistry deserves something more in accord with it as a profession, and that those connected with it should make a more pronounced effort to support the only journal founded on a true independent basis. The necessity for an increased subscription list over that of other journals must be clear to the average business mind. It is needed that the journal may be placed on a solid financial foundation; but it is also more imperatively needed in order that it may extend its influence in the direction of a higher professional standard.

To those, therefore, who have already done much, the request is that they do more work in their societies. This is the best direction to labor, and this is the proper time to begin this effort,—at the opening of a new volume.

The INTERNATIONAL DENTAL JOURNAL was founded as a medium for independent professional thought. It does not invite controversial papers in which a partisan bias is too plainly apparent, but it offers a place where all the product of the dental mind is welcomed, for in this way only can truth be discovered. The management have no commercial interests that require protection, but they have an ever abiding faith that progress in any direction does not come by sitting idly with folded hands and dumb voices, but that all advance is the result of persistent effort to rouse the apathetic to a clearer perception of their duty to themselves and to the dental profession.

Bibliography.

THE AMERICAN TEXT-BOOK OF OPERATIVE DENTISTRY. In Contributions by Eminent Authorities. Edited By Edward C. Kirk, D.D.S., Professor of Clinical Dentistry in the University of Pennsylvania, etc. Second Edition, revised and enlarged. Illustrated with Eight Hundred and Ninety-seven Engravings. Lea Brothers & Co., Philadelphia and New York, 1900.

This, in many respects the most valuable work on operative dentistry published in the English language, is presented to the dental profession in its second edition. The fact that this has been required in such a comparatively brief period since the first edition was published, indicates more than words that it was needed in the educational work of dentistry.

There are many objections, however, to this form of cyclopædic presentation as a text-book, and this was noted in the original review of this book by the present writer, but the editor does not regard it as a serious difficulty, for he says in the preface, "The editor is fully aware of the importance which attaches to the work of harmonizing the treatment of the individual subjects and of so co-ordinating them that conflicting views shall not confront the student and thus interfere with his advancement into an untrodden field. . . . Specialization in operative dentistry has not reached the point where it may be deemed best to limit the field of text-book treatment to its technical procedures and relegate the allied subjects to separate volumes."

While this is in part true, it becomes necessary, as each branch develops, to confine it as much as possible to the procedures legitimately belonging to it, hence it would seem that dental embryology is not, strictly speaking, part of operative dentistry, any more than would be comparative anatomy. These subjects, of great value intrinsically, should be considered apart from technical procedures. The same may be said of histology, but there is some reason for the appearance of this valuable paper, inasmuch as operative procedures hold an intimate connection with all the tissues, and their minute

structure is of constant importance and must be considered in every operation. The reviewer is of the opinion that the time has come when books must cease to teach everything. Dentistry is becoming more and more specialized, and the question will require an answer in the near future, How may the different subjects be classified to prepare satisfactory text-books? In the present volume large space is given to orthodontia. This is ably handled by a recognized specialist, but it is thought it would have been better had the matter been reduced to a systematic consideration of principles and appliances, for the reason that no branch of dentistry has been more thoroughly or more ably treated in separate volumes than this of regulating teeth. It also occupies the border-line between prosthetic and operative dentistry, and may legitimately be classed with both. While the limiting, or removal, of these would lessen bulk, an important matter, it would have given room for the admission of a chapter on artificial crowns. This is mainly an operative procedure, and in some respects entirely so. The preparation of the canals so much belongs to the operative side, and is so vitally important, that it seems wrong to relegate it wholly to the mechanical branch of dentistry. The division might properly be made between the insertion of single crowns and bridge-work, the latter strictly belonging to prosthetic dentistry.

With the exception of the chapter on "Dental Histology," profusely illustrated, and that on "Antisepsis in Dentistry," there are no new chapters, but all have undergone revision by the various authors, so that on special practical subjects they are all brought up to the present period.

The readers of this volume must regret the great loss sustained in the death of one of the original and principal contributors, Dr. Burchard, for through this sacrifice the work he did upon the first edition has failed to receive his careful revision, and still evidences the need of a more extended practical experience than was originally given it. Under the present circumstances criticism would be entirely out of place, but the reviewer cannot avoid calling the editor's attention, on page 471, to the use of a ten per cent. formalin solution. It is well known that an excess of one per cent. is too irritating where such an effect is not to be desired.

There is a very common error made very frequently by writers, and noticeable here, in making use of the expression, "As pointed out by Dr. —." Now, the subject-matter may be as old as den-

tistry, but it leads to the impression that the individual mentioned was the discoverer or originator of the process. This makes wrong history, and has been the source of much confusion in questions of fact, as well as much misplaced honor.

The author of the chapter on "Pyorrhœa Alveolaris" still adheres with partisan pertinacity to his conception of the etiology of pyorrhœa, and hence devotes large space to the consideration of gouty conditions and calcic accretions, due to this diathesis, upon the teeth. He fails to give other possible causes for this disease, and almost entirely ignores the possibilities of local irritations. In view of the extended investigations of many, especially those instituted by Dr. Talbot, some notice should have been given these, made both at home and abroad. The influence of bacteria is given but a single paragraph. It does not appear that he regards these as having any near relation to the origin of pyorrhœa, a very unfortunate error, it seems to the reviewer, for the student reading this book will naturally be impressed with the fact that gout, in its protean forms, is the sole cause of this disease. The writer, with an extended experience, has failed to find that gout has any direct influence in producing pyorrhœa; in fact, it can be cured without any systemic treatment in those afflicted.

Objection is also made to the author's limitation of age. He says, "It is rarely seen before the age of thirty, and still less frequently does it make its appearance after the age of sixty." This is certainly an error, for the writer has frequently met with it at twenty, and it is quite common after sixty; in fact, the conditions all favor it after that age, but it is due then to causes which space will not permit the reviewer to enlarge upon.

The objections made here and there in this review are not brought out prominently in a hypercritical spirit, for the book is regarded, as a whole, as a type of that advanced dentistry that belongs to and is a part of that work at the close of the nineteenth century. It thoroughly exhibits upon every page the advance made in operative dentistry since the close of the first half of the century.

The editor can be congratulated upon the care taken to avoid conflict of opinion between the various contributors, a serious task where so few agree upon practical methods.

Dentistry owes a debt of gratitude to Lea Brothers & Co., that they have been willing to risk large expenditure in the publishing

of the dental series, and it is a satisfaction to feel that this outlay has resulted in no loss to them and has proved of incalculable benefit to the dental profession.

The illustrations are profuse, and fully maintain the character of the first edition.

TREATMENT OF MALOCCLUSION OF THE TEETH AND FRACTURES OF THE MAXILLÆ. Angle's System. Sixth Edition, greatly enlarged and entirely rewritten. With Two Hundred and Ninety-nine Illustrations. By Edward H. Angle, M.D., D.D.S., former Professor of Histology, Orthodontia, and Comparative Anatomy of the Teeth in the Dental Department of the University of Minnesota, etc. The S. S. White Dental Manufacturing Company, Philadelphia, 1900.

This volume, the sixth edition of this valuable work of the author, has been so much improved that it almost assumes the character of an original production. The author says of it, "The subject is treated far more comprehensively in this edition than in those which have preceded it, they having been limited to the mechanical phases of the subject. . . . It has long been the effort of the author to perfect a system which should be complete within itself. . . . The degree of his success must be determined somewhat by time and the intelligent unbiassed judgment of others."

It has been the hope of many minds interested in orthodontia that at some future time a system would be devised that would largely eliminate the necessity for inventing an apparatus for every given case. To this end Dr. Angle has devoted years of work, and that he has, in a large degree, succeeded must be acknowledged by every careful reader of this book. When the writer first began to teach methods of regulating teeth he was met at the very threshold of his inquiry with the necessity of a system, and it seemed to him that, while the presentations of irregularity appeared in many forms, they, nevertheless, seemed to follow one general law and became amenable to one general method of treatment. That Dr. Angle recognized this, and sought a mechanical way out of the difficulty, deserves, and should receive, the highest commendation. Whether his methods are the best possible is quite another question, but to the writer they seem to meet generally all demands. Their greatest merit must be found in the entire elimination of the old and

clumsy apparatus connected with plates so much in vogue at an earlier day of practice.

The author contends "that occlusion is the very basis of the science," and, therefore, he makes, in the pages that are to follow, "occlusion the central thought, and on it bases the classification of malocclusion, . . . and will define orthodontia . . . as being that science which has for its object the correction of malocclusion of the teeth."

The importance of correct facial lines is quite fully elaborated in the chapter on "Facial Art," leading up to "etiology of malocclusion," and in Chapter IV. to "Classification and Diagnosis of Malocclusion." Upon this classification, which seems to the writer to cover very nearly all presentable cases, is based the system of treatment.

Chapter V., on "Alveolus and Peridental Membrane," is a clear statement, beautifully illustrated. The important considerations connected with this membrane, in the movement of teeth, is too generally neglected by practitioners, and it is, therefore, a satisfaction to find that the author dwells upon the changes produced by pressure. He might have gone farther and explained the resulting effect of a long-continued and uninterrupted force. As the reviewer reads this book it seems to lack in this essential point, that while it shows how to do the work, it fails to warn the operator sufficiently that a non-intelligent use of appliances may lead to serious pathological conditions.

The author makes use, mainly, of German silver in the preparation of appliances, for the reason, "It is very susceptible to skilful working, and may be developed to possess great strength and rigidity as demanded by the jack and traction screws."

The "Author's Appliances" and the following chapter on "Soldering" are exceedingly valuable as a guide to the student and practitioner. That portion relating to clamp bands is especially good, as it furnishes a ready method of meeting a practical difficulty.

The operation of "Immediate Movement" does not appeal to the author's judgment, for he remarks, "It is a practice as inexcusable and impracticable as it is barbarous." In this opinion the majority of operators must coincide. He, however, advocates the "Resection of Peridental Fibres,"—that is, severing the fibres of the peridental membrane prior to attempting movements of teeth.

The reviewer must regard this as equally barbarous with that of torsion by force, and to his mind wholly unnecessary.

The author favors early regulation for the reason that "the position of teeth may be more readily changed in early childhood (from seven to twelve years of age) than at any other period."

The author has very little regard for the plan of extraction for the purpose of regulating. He contends "that it is difficult to lay down any precise rule regarding extraction, but it is a matter which involves the broadest consideration and closest study of each case, often taxing the judgment as much as does any problem in orthodontia."

It is impossible to follow the author through all the practical pages he presents to the reader. The dental profession is quite familiar with Dr. Angle's appliances, and their extended use is the best evidence that he has succeeded in impressing his methods upon the minds of a very large number of practitioners. The reviewer, however, cannot agree with him in his opinion that it is practically waste time to teach the manufacture of regulating appliances to the average student. To the writer it seems as though this should be the most valuable training in prosthetic dentistry. It is true that not all are capable of making appliances with skill, but all can acquire the knowledge of how these should be made, and this is quite as important as the ability to manufacture.

The most valuable portion of the work of Dr. Angle, as the writer views it, is the fact that he has, to a large degree, perfected a system of regulating teeth; and while we may differ with him in some respects, the main fact still remains that he has accomplished a great work in leading the dental mind into correct methods of diagnosis and practice. This the sixth edition of his work is, therefore, cordially recommended to every practitioner of dentistry for both its practical and its intelligent conception of what is necessary in the movement of teeth.

The book is presented with the usual care and taste of the S. S. White Dental Manufacturing Company.

Domestic Correspondence.

REPLY TO DR. J. MORGAN HOWE.

PHILADELPHIA, November 20, 1900.

TO THE EDITOR:

SIR,—In the November issue of the *INTERNATIONAL DENTAL JOURNAL* I have read with pleasure an article on “Professional Dignity,” by Dr. J. Morgan Howe. The keen sense of propriety and appropriate ethical conduct which Dr. Howe in his daily life represents makes him always an interesting writer and speaker.

It is possible, however, that he has taken rather a pessimistic view of the profession, and of college graduates, when he refers to Dental Parlors and their promoters as representatives of college graduates. It is true, however, that the commercial spirit is an important factor in dental journalism as well as in dental practice, but it is not necessarily true that this spirit or desire for profit or gain is antagonistic to the ethics of either medicine or dentistry. Nor is it true that such journalism is retarding “professional progress;” nor is it true that “trade channels,” largely influential in publishing dental as well as medical literature, are inconsistent with true professional dignity.

It is, however, unfortunately true that what we are pleased to term “independent journalism” has a life and death struggle, and that the publication of expensively illustrated articles must seek such sources of publicity as can be fostered by the profits of trade.

Trade is not necessarily unethical; it is certainly not in that degraded condition that the truly professional man must say, with holy horror, “‘Touch me not’ for I am ‘holier than thou.’”

The writer has been for many years quite, yes, very conversant with men interested in trade, and, without expecting to be in harmony with every act, there is much to be admired in results that have been achieved through trade. Unselfish and self-sacrificing have transactions often been; temptations have been resisted that would have made individuals independently wealthy had they yielded. It would not be difficult to bring to the doctor’s mind

efforts on the part of men that have been exhausting, expensive, and most perplexing, yet persistent and untiring labor has been pursued which has liberated hundreds, if not thousands, of others from burdens and impositions, that would not only have been onerous but exasperating, and all done in a perfectly ethical spirit.

Does not Dr. Howe realize that but for the protection of associated effort he, with many others, might now be paying unjust royalties on many delicate and artistic operations. And yet upon the instigators of this protection he casts a slur, with an expressed desire to cut loose in the matter of ethics from those interested in, or conducting, such associations. He can certainly broaden his mantle of charity without being unethical.

The doctor has trodden upon sensitive ground when he speaks of colleges using preparations of which nothing is known save the name of the maker; he of course alludes to alloys and zinc cements. The writer must make his protest. Nothing has ever been used in the clinics of the school with which he has been connected that was not definitely familiar to the professor in the special department, and every professor teaching the practical branches in the good dental schools is certainly thoroughly conversant with all the ingredients in both of these compositions. He also knows that slight variations in the quantity of the several ingredients, and subsequent treatment, may, indeed does, produce varying results, and that the annealing process, which is now so universally applied to alloys, has its beneficial influence on the manipulative process and final results. All of this knowledge in well-conducted schools is carefully given to the student by the professor having charge of that practical branch.

The doctor greatly laments the commercial control of dental literature. If it will be of any comfort, let me remind him of the condition with which he is certainly familiar,—that is, that medical literature is equally under trade control.

While the human body has to be nourished and protected from thermal changes, nothing will be so sensitive as the profits or emoluments of labor, mental and physical. But this profit ought all to be acquired without violation of ethical conduct, and most heartily will the writer commend any and every effort the doctor can make towards elevating the moral tone of societies, practitioners, and colleges.

C. N. PEIRCE.

Current News.

FOREIGN RELATIONS COMMITTEE OF THE NATIONAL ASSOCIATION OF DENTAL FACULTIES.

To the Deans of the American Dental Colleges, Members of the National Association of Dental Faculties, and the Members of the Foreign Advisory Boards:

GENTLEMEN,—The regulations of our National Association place the supervision of foreign educational matters which affect American colleges in the hands of the Foreign Relations Committee, and of the European Advisory Boards.

At the last annual meeting some new regulations were adopted, which limit to a certain extent the reception of foreign students, take the matter out of the exclusive hands of the Deans, and make it uniform in all the colleges by requiring the approval of the Association through its proper committee, whose decision must be reviewed at the annual meeting. We think all will comprehend the advisability of this, that the Deans may have some rule by which they may be governed and be enabled to avoid the responsibility of the acceptance of credentials in foreign tongues, with which they may not be acquainted.

We all agree upon the desirability of some uniform standard which shall apply in every case, and which will be just to all. It is quite probable that the regulations adopted at the last meeting of the National Association, which were recommended by the Foreign Relations Committee, will need amendment as we obtain further knowledge concerning foreign equivalents. The Foreign Relations Committee will each year present to the Association any new information which they may have upon the various subjects, and be prepared to make such recommendations as in their judgment will best secure the end in view. In obtaining this knowledge the Foreign Relations Committee must necessarily depend very largely upon the Advisory Boards. To these positions have been appointed the men who in the minds not only of the Foreign Relations Committee, but other well-informed members of the profession whose advice they have sought, are best qualified to perform the necessary duties. Hence we feel that we may rely upon their recom-

mendations, and as they are so completely and honorably identified with us and are aware of the responsibility resting upon them, we do not fear that our confidence will be misplaced.

The regulations adopted at the last annual meeting of the National Association have been widely published; they have been incorporated in a pamphlet circular of information and sent to every one concerned. Hence all have had an opportunity for knowing just what was the action taken. We trust that before the next meeting of the Association all will have so fully considered the situation that they will be better enabled to act than they were when the regulations were adopted.

Since the annual meeting at Old Point Comfort, the members of the Foreign Relations Committee have carefully consulted with each other, and have unanimously arrived at the conclusion that it is not wise to attempt the enforcement of the regulations during this year, for the following reasons:

First, Those regulating the giving of advanced standing in our schools were not adopted until after the announcements of the colleges for the current year had already been published and distributed. It has been established by precedent that in such instances legislation should not go into effect until the next succeeding year.

Second, The regulations adopted at Old Point Comfort could not be promulgated until students from foreign countries had already, in some instances at least, sailed for America, and it would be an unjustifiable hardship to make them subject to new rules with which they had no opportunity to become acquainted.

Third, It has appeared to us advisable, before attempting to enforce them, that the new regulations should be published to the world for the benefit of all concerned, that it might be learned if in any way they work injustice, are impracticable, or are not in accordance with the laws of this or other countries.

Accordingly, the Deans who have forwarded to the Committee the papers of students have been informed they can use their discretion in the case of those from Great Britain, Germany, Austria, Switzerland, France, Holland, Belgium, Sweden, Norway, and Canada, subject always to the subsequent approval of the National Association. Even although there may be some technical lack of observation of the rules, the Foreign Relations Committee will take no cognizance of it, so long as the Deans act in good faith,

always provided that the students shall obtain the approval of their papers by the Advisory Board of the country from which they come.

The above relates solely to the giving of advanced standing in our colleges on the basis of attendance on foreign schools, which may be offered as an equivalent for courses in our own institutions.

Concerning the preliminary educational and moral qualifications, and the reception of foreign students as members of the freshman class, the approval of the Advisory Board for the country from which the student comes should, in all cases, be insisted upon as provided by the regulations adopted at the annual meeting for 1899. Should a foreign student present himself without certificate, the Dean may, upon his own responsibility, receive him temporarily, on condition that within a reasonable time he shall secure such approval. If this is not done, the student shall be dismissed before the middle of the term and no credit be given him for his attendance.

This ruling of the Foreign Relations Committee may seem somewhat unnecessary, but it is deemed best that it shall be promulgated by means of this circular, that there may be no misunderstanding or misconception of the law of the Association. It is not to be understood that the Foreign Relations Committee desires to assume any authority not fully conferred upon them by the National Association, to which in every instance it is responsible. It desires to so inform the Deans and others interested that trouble may be saved, that there may be a full comprehension of the situation, and that it may not be imagined they are in any way attempting to interfere with established custom, or with the published rules of the National Association.

Yours truly,
N. C. BARRETT,
Chairman Foreign Relations Committee.

THE THIRD PAN-AMERICAN MEDICAL CONGRESS.

THE Third Pan-American Medical Congress will convene in Havana, Cuba, February 5, 1901. An invitation is extended to dentists who may desire to attend and read papers before the Sec-

tion on Dental and Buccal Surgery. The Committee on Transportation has made the following report on rates for the delegates at the present time: The Southeastern Passenger Association has authorized a rate of one fare for the round trip to Port Tampa, Fla., plus two dollars (exclusive of Pullman berths and meals), connecting with the Peninsula and Occidental Steamship Company at Port Tampa, which has authorized a rate of \$36.50 for the round trip from Port Tampa to Havana, including meals and berths in each direction. This makes the rate through to Havana from Washington, \$70.05; from Cincinnati, \$68.30; from Louisville, \$67.55; and correspondingly low rates from intermediate points. The Trunk Line Association has authorized excursion fares to Washington added to the fares authorized by the Southeastern Passenger Association, which includes all regular ticketing routes. The Central Traffic and Western Passenger Associations have authorized regular winter tourist rates. Delegates from these territories may find it to their interest to pay local fare to Cincinnati or Louisville, and use the authorized rates from these points as outlined above. The Ward Line steamers from New York have authorized a rate, including meals and state-room in each direction, of \$60 for the round trip from New York to Havana, sailing Wednesday and Saturday; time, five days in each direction. Those who use the Ward Line to Havana, paying \$60 for the round trip, can return either from Port Tampa or Miami by rail. By returning the unused portion of the ticket a rebate of \$20 will be received. These tickets must be purchased from Havana over the Peninsula and Occidental Steamship Line to Port Tampa or Miami, and then by rail. No rates have been arranged so far for the New England territory. The United States Fast Mail leaving Washington over the Southern Railway at 11.15 A.M. arrives at Port Tampa, Fla., at 10.30 P.M. the next evening, making connection with the steamer leaving Port Tampa at 11 P.M., arriving at Havana the morning of the second day. Extra sleeping-cars will be run from New York over the Pennsylvania Railroad, Southern Railway, and Plant System to Port Tampa. The train leaving Cincinnati over the Queen and Crescent route at 8.30 A.M. will arrive at Port Tampa at 10.30 P. M. the following day, connecting with the same steamer. The train leaving Louisville over the Southern Railway at 7.45 A.M. connects with the Cincinnati train at Lexington, Ky., at 10.45 A.M. All these schedules unite at

Jacksonville, Fla., and go through to Port Tampa and Havana. It is suggested that the delegates from the East mobilize through Washington and those from the West through Cincinnati. Those wishing to attend will please send their own names and addresses, and of their party as well, to Eugene S. Talbot, 103 State Street, Chicago, Ill. The information will be forwarded to the Chairman of Transportation, so that sleeping-car and steamer accommodations may be reserved.

EUGENE S. TALBOT,
Secretary Section on Dental and Buccal Surgery.

GALVESTON DENTAL SOCIETY.

GALVESTON, TEXAS, November 20, 1900.

TO OUR PROFESSIONAL BROTHERS:

Our Society met and decided to send out, for the first time perhaps in the history of dentistry, a letter asking for relief.

The late terrible disaster which swept over our city has fallen heavily upon the resident dentists; some have lost their homes, others have sustained losses which will be hard to cover, as our people are in an impoverished condition. Our practice will be a limited one for a long period.

Since we will not participate in the general relief fund, most of which has been expended in feeding and clothing the very unfortunate and in removing the wreckage, which still gives up its dead two months since the fatal night of September 8, we feel that our more fortunate brother dentists will "throw out the life line" and aid us in a small way to retrieve our losses.

The First and Second District Dental Societies of New York responded in a most generous and substantial way, and if others would follow their noble example we will soon be lifted out of our present distress. We hope to see our city in a few years what it once was, the gem of our Southland, and we a happy people but for the memory of our eight thousand relatives and friends who perished on that fatal night of September 8, 1900.

Send contributions to H. W. Lubben, President, or D. S. Kilough, Secretary, 2123 Market Street, Galveston, Texas.

Respectfully,

GALVESTON DENTAL SOCIETY.

PROGRAMME OF THE ROCHESTER DENTAL SOCIETY, SESSIONS 1900-1901.

THE following essayists will read papers during the sessions of 1900-1901 before the Rochester Dental Society:

October 16, 1900, Dr. C. F. Bunbury, Esthetic Dental Prosthesis; November 13, 1900, Dr. W. W. Smith, Care and Treatment of the Dental Pulp; December 11, 1900, Professor C. H. Ward, The Welding Properties of Gold; January 8, 1901, Dr. G. Goode, Practical Sterilization of Instruments; February 12, 1901, Dr. J. W. Cowan, Pathogenic Affections of the Oral Cavity; March 12, 1901, Dr. R. H. Hofheinz, Amalgam from the Sanitary Point of View; April 9, 1901, Dr. F. Messerschmitt, Operative Prophylaxis of the Oral Cavity; May 14, 1901, Dr. J. Requa, Is Decalcified necessarily Devitalized Dentine? June 11, 1901, Dr. F. H. Lee, New Appliances and Methods; Special, Dr. J. N. Crouse, Professor Black's Experiments and the Test of Time; Special, Dr. J. Edw. Line, Tooth Decay a Race Characteristic.

NEW JERSEY STATE DENTAL SOCIETY.

At the annual meeting of the New Jersey State Dental Society the following officers were elected for the ensuing year: President, Dr. F. Edsall Riley, Newark; Vice-President, Dr. Wm. L. Fish, Newark; Treasurer, Dr. Henry A. Hull, New Brunswick; Secretary, Dr. Charles A. Meeker, 29 Fulton Street, Newark; Assistant Secretary, Dr. H. S. Sutphen, 24 East Kinney Street, Newark.

Executive Committee.—Dr. H. S. Sutphen, Newark; Dr. Oscar Adelberg, Elizabeth; Dr. F. L. Hindle, New Brunswick; Dr. W. H. Pruden, Paterson.

Membership Committee.—Dr. G. M. Holden, Chairman, Hackettstown; Dr. J. L. Crater, Orange; Dr. W. W. Hawke, Flemington; Dr. A. Irwin, Camden; Dr. W. W. Woolsey, Elizabeth.

C. A. MEEKER,
Secretary.

THE International Dental Journal.

VOL. XXII.

FEBRUARY, 1901.

No. 2.

Original Communications.¹

BOXINGS.²

BY DR. GEORGE S. ALLAN, NEW YORK.

WHAT I wish to bring to your attention will require but a short time to describe and fully illustrate. At a meeting held at Dr. Davenport's the first of last winter Drs. Dwight Smith and F. Milton Smith described their methods of using facings. The Drs. Smith showed at that meeting some models of the work they had done and at the same time gave an account of the service which the work had been to their patients and how gratifying the results had been to them.

This set me to thinking that possibly I had been remiss in my practice. I began to make facings with more or less success. The success was more than enough to compensate me for the trouble. After I had put in facings for a month or two, to my disgust I found now and then the edges were not perfect, and again, here and there, a facing came off. Still, there was a real merit in the method which I could not afford to drop. I kept try-

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology, November 9, 1900.

ing different methods, and finally took up porcelain. I had a great deal of satisfaction putting in inlays. It then came into my head, working at the two, that there might be a combination which would be satisfactory,—that is, something having the value and a great deal more strength than the porcelain.

My method consists of an inlay made of two shells of gold, an outer and an inner one, soldered together at the margins, the interior being filled with cement when in place. I make these inlays or boxes with the assistance of my laboratory man, and I think to do this work successfully and with little loss one should certainly have the help of an expert plate-worker. The first step is to prepare the cavity, filling the undercuts, if any, so that the impression-material will easily come out of it. It is necessary that the margins be especially prepared: they should be clean cut and smooth. I then take an impression of the cavity with modelling compound and hand the impression over to my plate-worker. I will here read a paper prepared by my plate-worker, giving his method of procedure after the impression leaves my hand.

“The model is made of plaster of Paris in the ordinary way. Use Mellotte’s mouldine for making a mould of the cavity. Make a die of Mellotte’s die-metal, using a piece of soft lead for the counter-die. Swage pure gold (30 American gauge) in the cavity. Great care must be taken in truing the gold to the exact margin of the cavity. This can be done in the mouth, or if the outlines are clear, it can be done on the die or model. Melt a small drop of solder in the bottom of the little cup or matrix, being careful not to let it flow on the margins. This will give it strength for handling. Burnish the cup in the cavity; see that the margins correspond with those of the cavity. Take an impression in wax or compound to get exact contour.

“The thickness of the gold must be allowed for in the wax, to avoid the bite striking too hard. A die is now made as before; 22-carat gold is used, as it will stand wear better than pure gold. The two pieces are soldered together, the edges trimmed and polished. A few saw-cuts in the pure gold inner shell will be sufficient for the cement to adhere.”

After the inner shell has been returned from my mechanical man I place it in the cavity and burnish the edges carefully, seeing that they fit closely at every point. I then contour it out with

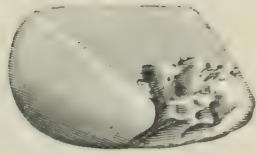
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SURGEONS OF ONTARIO



A



B



C



D



E

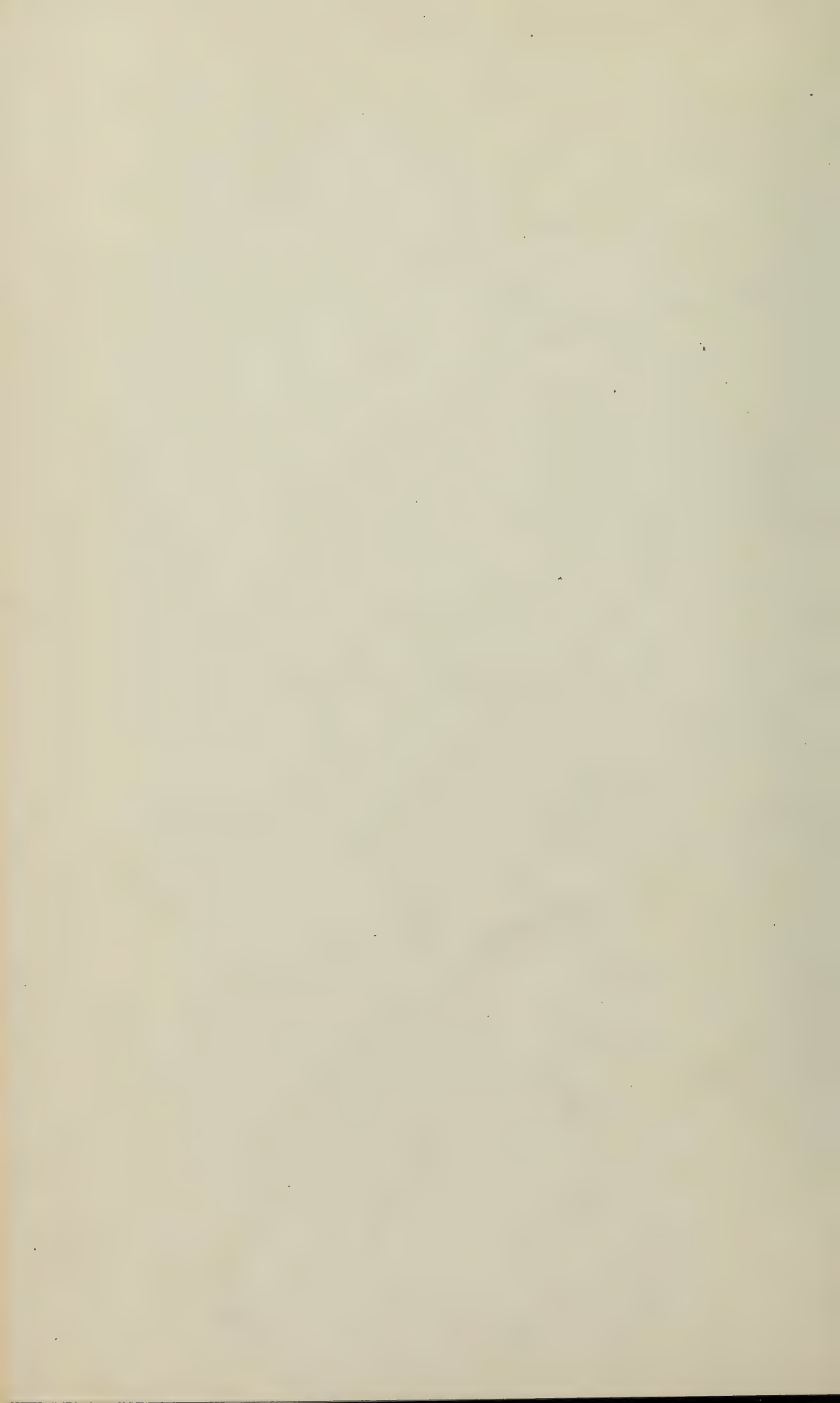


F



G

A, molar with cavity properly excavated; B, modelling compound impression of cavity; C, plaster cast from impression; D, gold shell made on C, fitting floor of cavity; E, outer shell, made from bite taken in D, properly contoured and articulated; F, outer and inner shells soldered together, making a box; G, box with slots cut through inner shell ready for setting.



wax, getting the proper shape and articulation, and return again to my plate-worker, who proceeds as he has described. When the finished box is returned to me, with a file I serrate the lower surface, at the time filing through this plate so that in setting the cement may be forced in, entirely filling the box. After the box has been filled, a small excess of cement is placed on this under surface, the boxing pressed home, and the excess of cement squeezed out. I believe this makes a filling more durable than a porcelain inlay because there are no thin edges that can be checked off, and there being no danger of breaking, however thin the box. It is better than a facing, because the margins are not liable to peel up, an objection I can urge to the facing. It is better than the all-gold inlay built up with solder, because with much less labor a perfect articulation is obtained without the grinding necessary in the case of an inlay of this kind or a porcelain inlay. I cannot state positively that this method is new; I only know that it is new so far as I am concerned.

THE USE OF AN ASSISTANT.¹

BY DR. A. H. BROCKWAY, NEW YORK.

WE hear much of the advance made in the practice of medicine and surgery within the past few years, and it has, indeed, been great, but especially do we hear of the progress made in that branch which we follow,—dentistry. Answering to the law of development, this itself has come to constantly cover a larger and larger field of usefulness, so that the tendency to divide into specialties, as has the parent profession, is already beginning to be observed. This condition demands on the part of the dentist a larger equipment in the way of instruments and appliances for the proper performance of his work, and their care and best service requires far more of the operator than did the simpler methods of earlier times. This being so, it is proper to inquire if we are

¹ Read before The New York Institute of Stomatology, November 9, 1900.

neglecting any means whereby we may increase our efficiency in this direction. I have long thought that many of us are doing so, and I wish briefly to point out in what respect. I refer to the employment of an assistant at the chair.

Of none of the improved appliances which have come into use—the engine, the rubber dam, the separator, the matrix—can the best service be got by one working unaided and alone. Take, for instance, the burring-engine: see how great an advantage it must be to have some one to manage it, leaving the operator to stand firmly on both feet, free to give his whole attention to the work he is doing, instead of balancing unsteadily on one foot, as most do, their bodies swaying with the movement of the propelling leg. Or, take the adjustment of the rubber dam, I have many times seen the dentist working alone spend from five to fifteen minutes doing this when with a trained assistant it could have been done, and with far less annoyance to the patient, in a tenth of the time consumed.

But many will assert that they are quite able and satisfied to do these things unaided. Able they may be, but satisfied they ought not to be.

Some years ago a country surgeon in a small backwoods settlement, in an emergency, alone and unaided, by the light of only a candle, successfully performed the Cæsarian operation. This, of course, showed great skill and courage; but how much lessened would have been the chance of failure could he have had the aid of modern hospital methods,—electric light and three or more helpers to wait on him. And yet there are many dentists, without this poor surgeon's excuse of necessity, going on in much the same inefficient way. Their attitude reminds me of a self-satisfied and unprogressive physician of whom I heard not long since, who, having a serious case of typhoid fever under treatment, scouted scornfully the suggestion that he have the assistance of a trained nurse, declaring that for his part he had rather see the devil enter a house than a trained nurse. It is gratifying to learn that the anxious relatives promptly took the case out of his hands and called in a man of more progressive ideas.

I am asked what kind of an assistant I prefer, and what are the specific duties required of one? My own experience has been considerable, having constantly employed one or more for the past

twenty-five years. I have had them of both sexes, but, all things considered, I prefer a young lady of at least sixteen or eighteen years. Such a one, if bright and intelligent, can soon be taught to become exceedingly helpful, and, barring the ever-present danger of lapsing into matrimony, is likely to remain an increasing satisfaction to the dentist and not less so to his patients, who soon come to regard her services as almost indispensable.

Now, how does my assistant assist? In the first place, she stands at the chair as constantly as I do myself, on the opposite side. When the patient has been seated she deftly arranges a large napkin about the neck to prevent soiling of the dress, then lightly smears the lips, especially the corners of the mouth, with refined vaseline to prevent chafing,—a very grateful precaution; she gently holds the lips out of the way while I make examination or during the preliminary cleansing of the teeth, always the first step in putting the mouth in order.

When the preparation of cavities is begun, she starts and controls the engine, and, if the cavity is to be cut out wet, as is often desirable, she throws on the bur from a syringe a stream of tepid water, keeping it from heating and enabling it to cut much cleaner and with greater ease, placing in the mouth during the process the saliva-ejector to relieve annoyance.

Should it be desired to cut out the cavities dry, she assists in adjusting the rubber dam or the cotton rolls; she helps to wipe out the cavity, using her own tweezers, and placing therein a proper obtundent; she prepares ready to my hand most filling-materials, and assists in their introduction; in short, in a hundred ways she serves to lighten my labor and conduce to the comfort of the patient.

In addition to all this she looks after my instruments and appliances, sees that the engine and hand-pieces are kept in order, and when any instrument has been used, that it is cleansed and returned to the proper place ready for its next service.

I have thus briefly indicated some of the duties of an assistant at the chair, and I must say that I consider the employment of one of the greatest advantage. The marvel to me is that so few of our number avail themselves of such a means of lightening their labor and so increasing their efficiency.

Some doubtless are kept from it by their dislike to having a

third person about the chair, many by the natural *vis inertia* which clogs most of us and restrains from entering untried paths, but I trust that what I have said may not be wholly unprofitable to those who have honored me with their presence and attention, and that it may prove more persuasive than was the sermon which St. Anthony preached to the assembled and delighted fishes, who all

“Swam up harmonious
To hear Saint Antonious ;
No sermon beside,
Had then so edified.”

But

“The sermon now ended,
Each turned and descended ;
The pikes went on stealing,
The eels went on eeling ;
Much delighted were they,
But preferred the old way !”

MUCH BOTHERING ABOUT A NON-ESSENTIAL FOR SUCCESS IN PRACTICE.

BY DR. B. F. ARRINGTON, GOLDSBORO, N. C.

IN the *Items of Interest* for October, 1900, page 751, we see it stated: “A question that is unsolved and is bothering not only the dentists of America, but also of England, and no doubt all of the thinking men of the profession in the world is, ‘Why teeth decay?’”

As regards practical benefits to be derived, we might as well be bothering about and asking why eyesight fails, or muscle and sinew weaken, what is the cause of cancer, and why people die short of advanced age? Such querying would be about as reasonable and would possibly develop as satisfactory results for evidence of cause.

To know the cause, if possible, of any disease or abnormal condition of the human frame, whether of the osseous structure or

soft tissues, is desirable, and must be anticipated as a possible ultimate result of earnest effort in scientific investigations. But will it not be well for us, in our efforts for more light and knowledge of causes, to consider and accept the fact that possibly there are freaks and features in the physical make-up of man that may never be so definitely comprehended and so explained as to profit either the afflicted or those who administer for relief.

Caries of teeth is a feature of physical defect that may present at any period of life from early childhood to old age, and has thus prevailed, in all probability, with some peoples since the earliest records of the human family (evidence recorded justifies such belief), and may continue to the end of time.

One fact connected with caries and worthy of thought is, that caries in attacking teeth, like cancer fleshy tissue, has special preference for certain parts, but varies and sometimes attacks where least expected and where there is no recognition of cause or evidence to justify belief that animate cause does exist in accord with the popular modern idea (germ theory); not even with the aid of best magnifying glasses are signs of cause detectable. It is a well-known fact that decay often presents on the buccal and lingual surfaces of molars (smooth surfaces) that are carefully cleansed and kept free from deposits and environments favorable for germ production and lodgement for development and action.

Many questions in medicine pertaining to cause of disease, as this "question" of caries in dentistry, are unsolved, but treatment goes on and cures are effected, and so it must be in dentistry. To be able to recognize and name correctly a disease when first seen is more important for successful treatment than to know the cause. It is well to know cause if possible, but if known definitely it is no guarantee against the existence of disease or of successful treatment.

A reasonable exercise of mind with dentists about the causes of caries, and more earnest effort to learn how to check the ravages of the disease and preserve the teeth in a normal state as near as possible would be more in range of possibility and in keeping with professional duty. Scientists will carry on the work of investigation and discovery of causes, and furnish facts concerning caries which dentists, as a whole or in part, may accept or reject, and shape action in practice accordingly.

Too many dentists are presuming to be scientists, and by their fumbling work mislead, create confusion, and mix up matters to a hurtful extent, attributable, possibly, to much guess-work and very little that may be called scientific.

More than a decade back it was proclaimed that through scientific investigations the cause of typhoid-fever had been discovered. The glad tidings were quickly heralded to all sections of country, and there was hope for freedom from the dread disease, but where is the physician who can say truthfully that typhoid fever is not as prevalent now and as well defined in every feature, and fatality as great, except in some hospitals, as before the cause microbe was discovered?

About the same period the distinguished Dr. Koch, of Germany, published to the world his discovery of the bacillus the cause of consumption, and created quite a general sensation and a decided craze with some physicians in many sections of country. There was a hurried rush of numberless physicians to Germany and back home again, with knowledge sought and a supply of the preventive and restorative lymph to be freely used as opportunity offered. Who of them after the lapse of ten years, with experience in the free use of the remedy, can mention a section of country or a defined locality where there has been a check of the disease or decrease of mortality through use of the saving lymph?

All scientific (so termed) discovery of causes and remedies for cure have not, when carefully investigated and thoroughly tested, proved as reliable and satisfactory as was desired and anticipated.

As in medicine and with physicians, so in dentistry and with dentists. The germ theory introduced and advocated by Dr. Miller, an able and distinguished scientist, and possibly more to be relied upon than any one who has written on the subject, has been accepted by a large majority of the most prominent men in the dental profession for some years past, and what of the results? Who can venture to say that caries of the teeth is not as common to-day as at the time Dr. Miller proclaimed his discovery and published his germ theory? So far there has been no evidence of check of caries, or abatement of its ravages. The disease prevails with destructive tendencies as before the notable discovery, and very likely will so continue indefinitely.

Within the past two years a prominent dentist, with some pre-

tensions as a scientist, has proclaimed discovery of the cause (a specific bacillus) of pyorrhœa alveolaris. But, unfortunately for those afflicted with the disease and for dentists disposed to battle with causes to check progress and effect cure, the bacillus as cause (so represented) is not found, only deep down in pus-pockets when the disease is far advanced, with considerable destruction of the peridental membrane and alveolus and much discharge of pus, almost too far advanced for general success in treatment. Under such circumstances it is reasonable to predict that no practical benefits will be derived from the important or non-important discovery.

As with caries, after discovery of cause, pyorrhœa alveolaris will in all probability continue as before discovery of the specific bacillus, and for check of progress when well advanced (bacillus or no bacillus) nothing short of heroic treatment in the use of steel instruments will avail.

If these causes of caries and pyorrhœa alveolaris, as stated, are facts, reliably established upon a basis of correct scientific investigation on right lines for discovery of true cause, it will be possible and natural to anticipate as results, perceptible in a reasonable period of time, decided check of progress and cessation of extreme features of advanced stages of both. But let us wait and see "what we shall see."

In course of time scientific work on the line of discovery of causes by men of skilled attainments, as Dr. Miller and others, as scientists, there may be development of truths that will enable us to eradicate successfully cause of caries and other diseases, and in future years caries will be known only as a thing of the past; but I must say, in all candor, I think it very questionable.

Scientific work on lines of investigation for discovery and the revealing of hidden mysteries and facts is essential and the work must be encouraged and sustained, that truths pertaining to many subjects may be made known and fully comprehended for the general advancement of civilization and professions and trades of all types and grades. Without the aid of scientific work by scientists there can be no promise of advance to higher planes of progress. But in relation to dentistry in recent years there has been too much (scientific, so called) theorizing about discovery of causes and sundry features pertaining to practice, much that has not

so far amounted to anything profitable in effect for check of disease and cure or improvement of practice, not even to the value of a penny.

Scientists, such as are popping up all over the country at present, are too numerous and incompetent, with rare exceptions, to be graded first class and accredited as reliable authority. There are but few of notable prominence, and some of them, like men in general in all callings, slip up occasionally and make laughable blunders, some so noticeable and conspicuous as to require prompt revision and correction. The most distinguished and reliable, with attainments unquestioned, are not beyond the reach of mishap and the possibility of varying from a true line of correct work and erroneous statements sometimes. Figures, microscopes, instruments, and chemicals will fail the most expert and skilful occasionally, consequently there are failures and misstatements that will lead astray if not corrected.

Hundreds of pages in dental journals and large volumes of accepted scientific works pertaining to dentistry and other subjects, and prized as valuable treasure in our bookcases, will in all probability, in less time than a decade or two, be discarded as unreliable and worthless, to make room for books on same subjects, more trustworthy—a natural consequence, as the result of progress in science.

So far the most of the scientific work of investigation pertaining to dentistry presented and accepted by the profession has been too immature to be accorded first rank or strictly reliable. However, the work of investigation will be continued, and every impetus that is given to it will the more surely secure to us gratifying results in fruit fully matured.

The revelation of facts, reliable and unchangeable, bearing upon dentistry and subjects pertaining to it is what we need and want, and will doubtless ultimately secure. Through scientific research and discoveries that may be made, it is possible that the causes of all the abnormal conditions of organs of the human body may be made known, and the various ailments that the human system is heir to may be successfully treated and checked in the stages of incipency. Hence no prolonged chronic suffering, no extensive decay of teeth to be treated with large fillings or crowns. Then there will be need for neither physician nor dentist of the present-

day status of qualifications and extravagant equipments for service as manipulators of the healing art.

Such advance and development of results as the ultimate outgrowth of scientific investigations may be anticipated as a reality, but in the may be distant future. But few of us, if any, now in practice can reasonably hope to witness the change involving the higher order of discoveries and professional skill in advanced practice, but we can and should willingly help the progressive work along, and pursue practice with the lights and aids we have, on best lines possible for advance and good results. We may feel assured that through the never-varying principles of evolution and the aid of scientific work, more matured, seals will be broken and mysteries revealed that will enable those following us to conduct practice on the more reasonable, humane and higher plane. All will then unite in harmonious acclaim with feeling of appreciation and gratitude, and generously proclaim all praise and honor is due and must be given to self-sacrificing scientists who have done so much, and so nobly in earnest, faithful work in the interest of humanity and the advancement of dentistry. This will be a pivotal point and the dawning of a new era in dental practice for preservation of teeth in a comparatively natural state.

The use of pluggers and forceps and other implements and features conspicuous in present practice will be discarded for the substitution of new features further advanced. The new and improved line of practice will be in accord with evolving science, regulated by a closer and more careful observance of the nature and requirements of the human system, its varied freaks and weaknesses, and requisite need for aid at all ages and under all circumstances. Such is reasonable to anticipate as possible, and must be worked for and hoped for.

We must anticipate and hope for the certainty of definite realization of advanced and highest features of attainment in the work of scientific investigation and superior skill and expert service in professional work, whether on lines of prevention or cure.

The zenith will be attained, time not definite, but, as a fact, ultimate, it is evident. What then will be the fate of some of the popular features in practice at the present time,—wholesale extraction of teeth, ornamental display fillings, gold caps, crowns and bridges, the use of numerous useless dentifrices, antiseptic

and disinfectant mouth-washes, and the many worthless local anæsthetics? All of them must unquestionably be discarded for a line of practice more in keeping with the limited scope of the needs of the teeth and associate tissues, practice strictly in keeping with physical laws and for the best support of the human system from early childhood to advanced age. The result will be well-preserved teeth and gums and freedom from much physical discomfort, with a reasonable probability of increased longevity, a state of things desirable and quite as possible, and as reasonable to anticipate as many of the changes and advanced features in practice some of us have witnessed during the past half-century.

The change is needed and is pending. We may as well prepare for the inevitable.

SYPHILITIC INTERSTITIAL GINGIVITIS.

BY EUGENE S. TALBOT, M.D., D.D.S.

A FIFTY-SIX-YEAR-OLD woman was sent to me, November 16, by her family physician. I found her suffering intense pain throughout the superior alveolar process. The teeth of the upper jaw were all in place. Absorption of the alveolar process was marked and extended back from the cuspids upon both sides. The bifurcations of the roots of the molars were exposed. The alveolar process was quite thin over the roots. It had obviously been absorbed laterally as well as in line with the roots. Intense metabolic changes had clearly taken place at some earlier period. The gums and mucous membrane over the anterior alveolar process had a bright-red appearance. The gums were smooth, neither puffy nor engorged with blood, nor did they bleed upon touch. Teeth felt uncomfortable on occlusion with those on the lower jaw. Several of the inferior teeth had been lost. They had become loose and had been easily extracted some years previously. There was no pyorrhœa. Her hair had dropped out some years previously, and was at the time of the examination very scanty. She had had joint-rheumatism for some years. She was neurasthenic. There was profuse leucorrhœa. Application of iodine to the gums

produced most intense pain. On consultation with her physician, we decided she was suffering with secondary syphilis. She was given potassium iodide and ordered to drink large quantities of water and to take ten grains of lithia twice daily. She began to improve from the beginning of the treatment in a marked manner. The pain ceased and the tissues are now nearly normal.

PREDISPOSITION AND ENVIRONMENT.

BY DR. G. ALDEN MILLS, NEW YORK.

THROUGHOUT all the civilized world science is busied upon something that will give immunity from disease to the human race, but the natural man will never see that day. Physical laws to produce a perfect organism must have absolute harmony. The natural man was so created, and put into surroundings that would sustain such a condition, but prohibition broke that harmonious state and prohibition will never reinstate it. Tell a human being that he shall not, and he surely will. Self-will has brought, alas! too many into bondage to human passion in some form that rarely if ever can be reversed by the individual man as man. Man as man has no power to reclaim or to forgive himself. Man, it is true, is the highest order of creation under natural law. The holy writ gives us a picture of its richness and beauty in the garden of Eden; and man was made monarch of all that he surveyed, and he was given the entire animal kingdom for his subjects. In his mentality lay the power to subject all creatures. Sickness nor death knew any place. Immunity from both was perfect. Provision for reproduction was made ample. No wonder that the Creator exclaimed that it was good. This condition was placed in the hand of man with but one condition. Man was created with a power or choice. It was in the testing of this choice that harmony of the physical law received its infraction, and discord brought disease and death into existence. From that moment a shadow was cast that has continued to lengthen, and which has hung like a funeral pall over the entire human race till now, with no power of itself to lift itself away. Where did this shadow first

manifest itself? This is a trite question at this point, for it opens the subject of this paper.

Can any one doubt for a moment that had generation commenced previous to this act of disobedience that the products would have been perfect? Every human being has the ability to know right and wrong. Consciousness of wrong came with the first act of disobedience. This led to uneasiness and fear and mental unrest. It needs no argument here to show us what results will be produced by these conditions continued. Cain was the first product of this uneasy pair; he was a murderer. The picture since that time is too dark to follow. To say that it is dark is to speak mildly. Look which way we may, it portends an ultimatum of utter defeat and failure to reinstate physical harmony. Sickness and death have ever since this fall prevailed with terrible destruction and devastation. The seed of disease has been sown, and it has continued to bring forth its kind. That which is born of the flesh will continue as it is. We can only palliate the effects, never eradicate. Now that we have taken our position, we will argue that it cannot be disproved. Not a few will deny our position, yet these denying ones dare not put to a test the truth that permeates the entire holy writ from Genesis to Revelation. "He that believeth my words shall have a witness in himself" that my words are the truth. We are not aiming at a sermon or theology; we are putting this subject upon a basis that cannot be shaken.

Assuming now that predisposition is plainly put before our minds, it is certain that all our efforts for eradication can only be, as we have said, palliative. We will not attempt to say that much is not being done for physical improvement, and that these efforts do not lessen the percentage of sickness and mortality. Predisposition to death comes because of this disobedience to the divine command. The wages of this transgression (sin) is death. In the first condition of mankind there was no such term as death. We shall argue that by violation of the command the spirit of the man and soul and body were thrown ajar. It can easily be surmised that the transgression brought a spirit of malignity which brought into play a spirit of revenge, and being brooded over became an impressible factor in the process of generation, and this became a matured trait in the character (or disposition) of Cain.

Here we see vividly the first act of predisposition manifested in an overt act, which we term murder. From our line of reasoning it is not difficult at all to follow out to a conclusion that all of our physical difficulties have their origin along the same line. Now Cain lives on and generates a race after his kind, and also the same with the children of Cain, and we have only to follow on a little period to note the dire results when destruction came upon the entire race, save eight souls. The history of the world shows a continuation of disease in a variety of forms that are not pleasant even to review. Just here we emphasize that the holy writ records that this predisposition was carried even to the fourth generation in specific disorders. We emphasize that there lurks continually what our none-too-much-honored friend, the late Professor Garretson, termed the "dis," that only needs favorable circumstances for a development. Therefore we assert that it will always be a life, in the natural, of contention with us. Disease is of satanic origin. It is an evil induction, and it can be overcome only by good, which is but another term for God. We stand face to face with human limitations in whatever direction we delve for knowledge. There is a line that the edict declares, "Hitherto shalt thou come, but no further."

Peter Cooper coined his immense fortune by the manufacture of glue, but he could not give us an analysis of it. The juices of the flesh are a hidden mystery to man's mind. Our bodies are organized into a complexity of organs that are under the supervision of function. It is along this line that what we term constitutional disease or disorders have their conception. So much are we the creatures of circumstances, the temperaments of our beings are effectually influenced and acted upon. At this point we see that environment is indicated. Environment brings out what predisposition makes possible. In our natural life we cannot wholly control our circumstances nor what may accrue from them. We may be led to extremes, either of which may result unfavorably. Dr. J. Leon Williams, of London, England, has given us what may be taken as an axiomatic statement, which cannot be disproved,—namely, "Predisposition and environment only make it possible for dental caries to thrive." We can only reduce them to a minimum result; to check them absolutely, never. We do not know at any moment what may overtake us and bring conditions

that will tend to lessen the normal energy of the nervous system. Right here we wish to introduce a term of immense value, and one that will be comprehended readily by the majority. The late Professor Garretson was, I am quite sure, the author of this term "resistibility." It is, I think, a good term for nerve. We resist according to the nerve we have. We recall a remark by another much-valued colaborer, Professor Jonathan Taft. He says, "In approaching a case of pyorrhœa we should look into the face of the patient and determine what we have to help or hinder." Why in the face? Any one who has diagnostic ability to a greater or less degree will detect the probable amount of resistibility, or help or hinderance. If we find a condition which Professor Garretson termed "tubercular," we have a condition that forces us to recognize the results of a predisposition. At this point many stumble over an inability to cope with such a phase of disorder on the lines of belief that disease of this type is of a local origin, and the treatment will be a proof that only local treatment will not meet the demands of the case. The more we can bring to bear intelligent diagnostic ability in all our dealings with the organic structures, where either surgical or mechanical practice is to be applied, the larger will be our success along the line of betterment. Not infrequently is the organic structure overburdened because of a lack of needed discernment and proper judgment through the exhaustive strain of needless services.

This article is closed with the declaration, often made when asked, "Can you cure pyorrhœa, so called, or Riggs's disease?" we cannot cure a disease.

Abstracts and Translations.

THE RECENT DEATH UNDER NITROUS OXIDE GAS.

BY DUDLEY W. BUXTON, M.D., B.S., M.R.C.P.¹

IN a paper read² before the Harveian Society of London, on May 17, I drew attention to the peculiar dangers of anæsthetics in cases of angina Ludovici and kindred conditions. These conditions are capable of a general anatomical description, and as the case to be referred to in the sequel is a striking instance of death arising through their agency, it may be well to devote some space to their consideration.

Individuals differ widely in the anatomical conformation of what in common parlance is called "the neck." The short- or bullock-necked persons are recognized as a type, and present in its simplest form the class of cases in which danger from anæsthetics may be expected.

The neck structures are less pliant, the head movements less free in these persons. When an attempt is made to turn the head to the side it is resisted by the muscles passing from the trunk to the head. The space between the walls of the faucial opening is usually lessened, and the structures forming it are commonly thick and fleshy. Under nitrous oxide gas the tongue and faucial pillars become engorged. The actual space available for respiration is thus further rendered less, and the dyspnœa increased. A very common associated difficulty in these cases arises from the immobility, or perhaps one should say, the lessened freedom of mobility, of the jaws. As the congestion of the soft parts increases, an almost spastic closure of the jaws takes place. When, as is so often the case, nasal respiration is impeded by old thickening at the posterior extremities of the nares, by a spur, or deflected septum, the perviousness of the upper air-ways is still more interfered with and the dyspnœa becomes intensified.

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² See *Lancet*, June 16, 1900.

In pathological conditions the impediments arising as a result of thickening of the tissues about the upper air-passages are increased, and the incident dangers *sub anæsthesia* exaggerated. To understand such conditions it is necessary to refer to the arrangement of the deep cervical fascia. Speaking broadly, this fascia may be said to surround the neck (the superficial layer) and to send inward to the deeper structures processes which ensheath the muscles and become attached to the vertebræ behind, the posterior surface of the clavicle, and inner side of the first rib in front. Other processes pass to the lower jaw, the zygoma, the sternum, and muscles in relation with the thyroid cartilage and trachea.

Under normal conditions these fascial septa support, but when inflammation exists they tend to bind, and render the neck structures unduly rigid. It is not uncommon occasionally in cases of lymphadenitis and perilymphaden to meet with extreme rigidity of all the structures adjacent to the upper air-passages, leading to difficulties during anæsthesia; but the most pronounced thickening occurs in suppuration involving the structures about the lower jaw. The outward appearances in these cases do not always give evidence upon superficial examination to the degree of involvement of the subjacent structures. As pointed out by Ludwig, the suppuration runs along the divisions of the fascia and produces very intense œdema of the tissues about the laryngeal and faucial openings. Œdema of the glottis forms the culminating point of this, involving the greatest danger to life. It is hardly needful to do more than mention that goitres, and especially the "plunging" tumors, constitute another cause of pressure leading to stenosis of the air-ways. In thickening of the structures of the neck, caused by suppuration, we meet with enlargement of the tonsils, tendency to secretion of thick glairy mucus, thickening of the structures about the air-passages, causing pressure upon them, and œdema, which may involve the mucous membrane of the trachea as well as that of the epiglottis and adjacent structures. The narrowing of the air-way thus induced causes dyspnœa, which is more especially inspiratory, although expiration is also affected.

In this condition, if the patient is given nitrous oxide gas, the result must be, unless means are taken to avoid it, that the venosity of the already carbonized blood is increased, the circulation in the tongue and faucial structures is further interfered with, and the tongue becomes swollen, and this hampers respiration still more.

Under such circumstances the liability to dangerous complications is very much increased.

The case of death under nitrous oxide gas reported as having occurred at the Great Northern Hospital unfortunately only too clearly exemplifies these statements.

In the evidence given before the coroner's court, the following facts transpired:

The patient, James Gibbs, a laborer, aged thirty-six, was seen at the Great Northern Hospital, and was suffering from a large abscess involving the tissues on the left side between the submaxillary gland and the ear, but extending also beyond the middle line to the right side. The left tonsil was considerably swollen. The man, although advised to enter the hospital as an in-patient, declined, and had, therefore, as the condition was urgent, to be treated as an out-patient. The man was seen at twelve noon, and the operation was undertaken at 4.15 P.M. on the same day. He was said to drink at times, but no evidence exists to give this statement any direct bearing upon the case. No statement is made as to whether or not the man spent the four hours between noon and four P.M. in or out of the hospital, but presumably it was outside the institution, and so no special preparation was made. It is common to ignore the necessity of preparation for "gas;" but in surgical cases of gravity, such as the one under consideration, it is wise to make a careful preparation of the patient as regards food, alcohol, etc., even when gas is used without ether or chloroform.

The patient was given nitrous oxide gas by one of the hospital residents, and the following is the description given of the procedure. An "ordinary gas apparatus" was used, fitted with valves. "First pure air, then a few respirations of air and gas, then pure gas" was inhaled. "One bag (? full) and a quarter was given in all." A statement made by the operator, another resident, affirms that "at no time was the patient breathing in and out of the bag." It is difficult to understand that a little over two gallons of nitrous oxide gas would induce complete anæsthesia in a man of the laboring class, unless the most complete to-and-fro breathing into the bag was adopted, and a large proportion of carbonic dioxide thus brought into adjuvant action with the nitrous oxide. Probably one or the other statement is open to correction, or, at least, modification.

The man is said to have taken the gas well, by which we may assume cyanosis, stertor, and marked dyspnœa were not early phenomena in the case. When ocular reflex was still present ("not entirely gone"—? sluggish) the face-piece was removed, and an incision into the abscess was made. The pulse was regular, the respirations were deep and regular, and the pupils of moderate size, and conjunctival reflex was present. The breathing then stopped, "after the excited stage was over." It is not clear what degree of narcosis is referred to "as the excited stage," possibly the appearance of jactitation. The cessation of breathing was accompanied by the appearance of cyanosis. Respiration appears never to have reappeared after its cessation. As artificial respiration failed to ventilate the lungs, tracheotomy was performed. The necropsy showed that there was much œdema of the uvula and faucial tissues, also of the epiglottis and upper part of the larynx. The left heart was empty, and both lungs much congested. It is a remarkable feature of this case that no dyspnœa is recorded as having occurred during the induction of an anæsthesia. As a rule, not only is dyspnœa present, but cyanosis soon appears, and these symptoms of impending asphyxia warn the anæsthetist to desist from the use of the anæsthetic.

That death was due to œdema glottidis is evident, but how far the giving of nitrous oxide gas accelerated the result must remain an open question. Possibly there may be two opinions. There is no doubt, however, that this particular anæsthetic is not the best one for persons with œdema involving their air-passages. If given at all, it should certainly be given largely diluted with oxygen. The after-treatment of the case also illustrates the fact that no treatment short of opening the trachea offers any chance of success. The apnœa is due to no central failure of nervous control, but simply to mechanical obstruction, and nothing less than the removal of that obstruction can be of the slightest value.

Then as to the question, does this case in any way shake the belief that, if properly given, nitrous oxide gas is practically a perfectly safe anæsthetic? I think not. The selection of the anæsthetic in this case was unfortunate, but nothing occurred but what might have been expected, and what possibly might have arisen if no anæsthetic had been employed.

In all such cases the risks of anæsthesia, even in the most practised hands, are increased, but such risks have reference to the

individual and his condition, and not to the anæsthetic as such. In fine, one may say that like most, if not all, the preceding cases of death under nitrous oxide, the fatality in question simply shows that gas, as gas, possesses few dangers, and these are those arising from mechanical interference with respiration. These are now well known and can be guarded against or avoided altogether. It also emphasizes the fact that even so safe a body needs care and a judicious decision as to its applicability in any particular case.—*The Dental Record.*

SPINAL ANÆSTHESIA.

THE method of producing anæsthesia by subarachnoid injections of cocaine solution into the spinal canal, suggested by Bier and exploited by Tuffier, has now been employed by so many different observers, who have reported their results, that a fairly reliable conception as to the efficacy of this procedure and as to its dangers may be obtained.

It seems to be well established that an injection of twenty minims of a one per cent. solution of cocaine into the subdural space by means of a needle driven in between the third and fourth lumbar vertebræ will occasion total anæsthesia of the lower extremities, the pelvis, buttocks, and inguinal region for a period varying from thirty to sixty minutes, without interfering with the consciousness of the patient and without producing signs of cocaine poisoning. During this period major operations, such as resection of the knee-joint, amputation, and the radical cure of hernia, may be undertaken and carried out without the patient's experiencing the slightest sensation.

Severneau (*Revue de Chirurgie*, No. 9, 1900) has employed this method of producing anæsthesia in seventy cases, the dose of cocaine varying from one-sixth to one-third of a grain. He notes that although anæsthesia was usually produced, the after-effects were sometimes extremely alarming; profound weakness, pallor, irregularity of heart action, stiffness of the neck, headache, and vomiting were sometimes persistent for two or three days and were obstinate to treatment, though caffeine and an injection of artificial serum seemed helpful. As a rule, these symptoms

were but slightly marked and did not last longer than twenty-four hours.

Tuffier notes that, following the injection, anæsthesia begins by a sense of pricking, crawling, and weight in the feet and legs, weight in the epigastrium, some nausea, and, exceptionally, vomiting. In addition, the patients become pale, have flashes of heat, sweat profusely, and the pulse becomes rapid. Headache is nearly always pronounced, but, as a rule, disappears in the night following the operation; sometimes it is agonizing and lasts for days. Tuffier has employed the method in one hundred and twenty-six cases without fatality in so far as the injection of cocaine was concerned.

Racoviceavnu has practised these injections in one hundred and twenty-five cases, failing entirely to produce anæsthesia in four, while in two others the effects were so transitory as to be of no service. In eighty-three cases the after-effects were extremely well marked, though not, as a rule, threatening.

Marx (*Medical News*, August 25, 1900) has employed this method of anæsthesia during labor, and states that it checks almost entirely the pains without the least danger to mother or child. Indeed, the mother does not know the child is delivered till assured of the fact by its cries. Complications of a severe grade were not noted.

Nicoletti, on the basis of an experimental research, maintains that these subarachnoid injections cause no anatomical alterations of the nervous elements.

In making these injections, the skin is thoroughly disinfected as for a surgical operation, the body of the patient is flexed, the spinous process of the fourth lumbar vertebra is outlined (and this is rendered easy by remembering that between the spinous process of the fifth lumbar vertebra and the first sacral vertebra is a pronounced depression), the hypodermic needle, between three and four inches in length, is driven in the middle line—preferably half an inch to one side—upward, forward, and when the lateral puncture is made a little inward, until the escape of some drops of cerebrospinal fluid indicates it has reached the subarachnoid space. Should the point of the needle encounter the bone, it is shifted until the intervertebral space is found. The cocaine solution is then injected and the needle is withdrawn. The procedure is an extremely easy one.

Except for the disagreeable and often threatening after-effects, this method of anæsthesia would in its workings be ideal. These after-effects can scarcely be attributed to the toxic effect of cocaine, and are probably due to a secondary congestion. It would seem wise to substitute for cocaine either eucaine, which may be thoroughly sterilized by boiling and is but one-fifth as toxic, or nirvanin, which is in itself antiseptic and is but one-tenth as toxic as cocaine. It is improbable, however, that this substitution will be followed by sequelæ less marked than those which develop when cocaine is employed in moderate doses, hence it would seem that subarachnoid injections are not likely to replace the already well established and comparatively safe methods now in vogue, save in exceptional circumstances. It is certainly true that until the method has received a more extended trial, and its immediate and remote dangers are better understood, it is not one which should be generally adopted.—*The Therapeutic Gazette.*

THE MOSQUITO-MALARIAL FEVER AND QUININE.

WE have from time to time kept our readers informed of the progress of what was at one time a most interesting hypothesis in regard to the dissemination of malarial fever,—namely, that it was caused by the inoculation of human beings through the agency of mosquitoes which had previously been infected by the malarial germ; and it will be remembered that we published in the original and editorial columns of the *Gazette*, towards the close of 1899, an interesting paper from the Hygienic Institute in Rome, detailing experiments which had been made to discover the best means of destroying the mosquito in its early development so that large tracts of land at one time almost uninhabitable because of these pests might become entirely free from this objection. Largely through the splendid enthusiasm of Dr. Patrick Manson, so well known to many of us because of his investigations into tropical diseases, and also through the interest of Grassi, Bignami, and Bastianelli, certain experiments have been carried out during the past year, and more particularly within the last few months, which are epoch-making in their results.

The most recent and one of the most important contributions

to this subject with which we are acquainted is the paper which appears in the *British Medical Journal* and in *The Lancet* of September 29, 1900, by Dr. Manson, in which he gives in detail the interesting measures which were taken for obtaining mosquitoes that had had an opportunity to become infected in such a manner that they were capable of transferring the infection to a human being. In order that his experiment might be startling in its effect, with the object of making the laity take an interest in this matter as well as the profession, he arranged that mosquitoes should be captured in Italy; that they should feed upon the blood of a malarial patient; that they should then be carried to the centre of London, where there is no malaria, and that a volunteer should expose himself to their bites; feeling confident that this volunteer would thereby become inoculated, being, of course, careful that the volunteer was a person who by no possible chance could ever have been subjected to malarial infection previously.

Bignami and Bastianelli sent Manson relays of infected mosquitoes from Rome in cages well devised for their safe transportation, care being taken that these mosquitoes were fed upon patients suffering from pure benign tertian infection, since it was recognized that to use mosquitoes which had been infected by the æstivo-autumnal parasite might produce serious pathological changes before the patient could be successfully relieved. The mosquitoes were forwarded to the London School of Tropical Medicine through the British Embassy at Rome. Some of them died on the way, and some died after their arrival. But a fair proportion survived and appeared to be healthy and vigorous. With true Spartan enthusiasm, Dr. Manson now arranged that his son, P. Thurnburn Manson, in Guy's Hospital, a man twenty-three years of age, should expose his hand to the infected mosquitoes. As a result Mr. Manson suffered from the characteristic symptoms of malarial fever, all of which symptoms disappeared when quinine was properly administered, and in his blood prior to the administration of the quinine Patrick Manson and other competent observers were able to discover the presence of the malarial parasite, which was identical with that in the blood of the patient upon whom the mosquitoes were fed in Rome.

We have, therefore, a most interesting pathological and therapeutic test of what was once a theory, and which is now a certainty. —*The Therapeutic Gazette*.

THE COMPARATIVE GERMICIDAL ACTION OF SOME DISINFECTANTS.

THE *Lancet* of June 23, 1900, has in it a paper by Burgess detailing some experiments made by him to determine the relative activity of various antiseptics. The specific germ selected for these experiments was the bacillus coli communis, a bacillus which occurs normally in the human intestinal tract, and in health appears to be innocuous, but which under abnormal conditions may become markedly pathogenic. This bacillus possesses some very distinct advantages for the purpose of this investigation; it is extremely easy to obtain it in large quantity, owing to the profuse nature of its growth on potato; it has many characteristic reactions, by which it can be readily distinguished from other bacilli, and by applying these at different stages in the course of the experiments it is possible to establish the purity of the cultures throughout; while, since it has, for a non-sporing bacillus, a comparatively high power of resistance to germicides, any results obtained with it may be held to apply even more forcibly in the case of other non-sporing bacilli, at any rate such as are pathogenic.

The bacillus was isolated from the stools of a young girl suffering from enteric fever by the method of successive gelatin plates. A pure culture having been obtained, and proved by means of the characteristic reactions to the bacillus coli communis, a stock culture was made on the sloped surface of agar-peptone bouillon in tubes, and from these subcultures on potato were taken as required. These were made on the surface of freshly prepared sterilized potato medium, and were incubated at 37° C. for ten days, when a profuse dark-brown growth, very characteristic of this bacillus, was found to have formed. This was removed with a thick sterilized platinum wire (care being taken not to carry along with it any of the potato medium), and mixed in a sterilized glass capsule with a little sterilized peptone bouillon so as to form a thick emulsion, into which the silk threads were immersed. These threads were cut from the finest "Turner's plaited silk," each being exactly one inch long, and were sterilized in a Koch's apparatus for one and a half hours in Petri dishes, in which they were afterwards dried and kept till required for use. After im-

mersion in the emulsion for ten minutes the threads were transferred with sterilized forceps to a Petri capsule, in which they were partially dried in the dark at a temperature of 24° C. for three hours by placing them in the "cool" incubator. They were next transferred to the disinfectant solutions to be tested, and after remaining in these for the allotted time were lifted out with a sterilized platinum hook, washed well in sterilized distilled water in order to remove any trace of disinfectant adhering to them, and placed each in a separate tube of sterilized peptone bouillon. These tubes were incubated at 37° C. for ten days, being examined each twelve hours for the first forty-eight hours, and after that daily. If no growth occurs, the bouillon is perfectly clear at the end of this time; if it does occur the bouillon begins to show signs of turbidity at a period varying from twelve hours, or even less, to seventy-two hours. The presence or absence of growth is further shown by microscopical examination, and by the inoculation of gelatin plates. If no growth had taken place at the end of ten days, it was concluded that all the bacilli present on the thread had been killed by the disinfectant solution. In every case a control experiment was made precisely as above, except that sterilized distilled water replaced the disinfectant solution, and in each instance growth was found to be present at the end of twelve hours.

Objection may possibly be raised to the above method on the ground that some of the disinfectant solution might be carried over on the thread into the bouillon, and so, by its antiseptic or inhibitory action, prevent the development of bacilli in the thread which were not actually killed by it. To guard against this, the threads were, as already stated, well washed in sterilized distilled water after removal from the action of the disinfectant, and as a further precaution all those tubes which exhibited no growth at the end of ten days were reinoculated from an emulsion of bacilli prepared as above and again placed in the incubator. In every such case growth occurred at the end of twelve hours, thus proving that the bouillon in these tubes was still a suitable medium for the development of the organism, and that their previous sterility was due, not to any transferred disinfectant, but to the fact that all the bacilli on the thread had been completely destroyed.

In order to establish a fair comparison between the germicidal effects of the various disinfectants tested, Dr. Burgess says he

decided to allow the threads to remain in solutions of them for certain definite lengths of time, and to ascertain the weakest strength of any given disinfectant which would destroy all the bacilli on the threads in these times respectively,—viz., one minute, five minutes, ten minutes, thirty minutes, and one hour. For each strength of a disinfectant solution acting for a given time (*e.g.*, carbolic acid 1 to 20, acting for five minutes) six threads were used, each being subsequently placed in a separate tube of bouillon and incubated. In by far the majority of cases the result was the same in each of the six tubes, either positive or negative, showing that every care had been taken to prevent contamination of the threads in the process of transference from the disinfectant solution to the bouillon tubes. But occasionally, when approaching the limit of the germicidal power of the particular strength of disinfectant used, there was some discrepancy,—*e.g.*, five tubes might give a positive and one a negative reaction, or *vice versa*, in which case the verdict of the majority was taken to be the correct one. If, however, the discrepancy was more than this,—*e.g.*, four and two, or three and three,—the experiment was repeated with a second set of six threads, and the majority was taken.

The following substances were tested: biniodide of mercury, perchloride of mercury, chlorinated lime, formaldehyde, lysol, carbolic acid, izal, medical izal, creolin, Jeyes's sanitary fluid, Walker's I. X. L. disinfectant fluid, Condyl's fluid, "sanitas" fluid, and boric acid. These experiments involved the inoculation and culture of some two thousand tubes of bouillon, and were conducted in the laboratory of the Manchester Union Hospital, Crumpsall, during six months of Burgess's tenure of the resident medical officership there.

In interpreting these results Burgess wishes it to be clearly understood that they are merely relative, and can only be held to be absolute under the exact conditions laid down for these experiments,—*i.e.*, where the bacilli are freely exposed to the action of the disinfectant in solution, no albuminous matter being present. In the actual practice of disinfection such conditions are never met with, the most important difference being the presence of albuminous material in greater or less quantity. Especially does this apply to the case of perchloride of mercury, which forms a definite combination with albumin, resulting in the formation of a comparatively inert albuminate of mercury, and thus, to main-

tain its efficiency, the strength of the solution would require to be increased in proportion to the amount of albuminous matter present.

Binioidide of mercury was brought into solution by the addition of iodide of potassium in quantity just sufficient to dissolve it, a stock solution of one part of binioidide in five hundred of distilled water being first prepared, from which the more dilute solutions were afterwards obtained by the addition of the requisite proportion of ordinary tap-water. The germicidal power of this drug is far superior to that of any other used in these experiments, and as it does not precipitate with albumin the results obtained should hold good even in the presence of albuminous material, thereby contrasting with the perchloride of mercury.

Chlorinated lime (commonly called "chloride of lime") is a white powder which is only partially soluble in water, and after standing for a little the insoluble portion falls to the bottom. This was kept in suspension in these experiments by frequent shaking of the glass vessel containing the threads immersed in the solution, but the germicidal power was not in any way altered by previously filtering the solution so as to remove this insoluble portion. In the stronger solutions of this substance not only are the bacilli on the threads all killed, but the threads themselves are destroyed, and in a short time almost all trace of them disappears.

Formaldehyde solutions were prepared from Schering's formalin, which is a forty per cent. solution of formaldehyde in water, the latter itself existing in the gaseous state.

Izal and medical izal, two coal products, are prepared by Messrs. Newton, Chambers & Co., the latter being a refined preparation of the former specially adapted to medical and surgical use. He found no difference between them as regards their germicidal properties.

Boric acid has no claim to be regarded as a disinfectant, since its saturated solution failed to destroy the bacillus coli communis in any of the allotted times.—*The Therapeutic Gazette*.

GELATIN AS A HÆMOSTATIC.

SCHLESINGER gives a long account of the introduction and use of gelatin as a hæmostatic (*Centralbl. f. Grenz. d. Med. u. Chir.*, 1900, Bd. iii. 209). In 1896 Dastre and Floresco found that intravenous injection of a gelatin solution in animals caused the blood to coagulate more rapidly when withdrawn from the vessels. Control experiments proved that this is not due to the well-known "setting" properties of gelatin. They also found that it antagonized the power of peptone in hindering coagulation of the blood. Camus and Gley explained the result by attributing it to the acidity of the gelatin solution; but Floresco, while admitting that the acid reaction has a certain influence, showed that neutralized gelatin is also active. Bauermeister explained it by an action in the leucocytes which are killed by the gelatin, and in dying produce the ferment which brings about blood coagulation. When injected subcutaneously the same effect is observed, but there is still much uncertainty regarding the rate and method of its absorption.

Carnot treated a severe case of epistaxis in a hæmophile by the injection of a five per cent. gelatin solution into the nostril, and the bleeding stopped almost at once. A second similar case was successfully treated by means of a ten per cent. solution. Many other forms of external hemorrhages can be controlled in the same way or by means of tampons soaked in the solution. Carnot says the gelatin must be carefully sterilized, which is best accomplished by heating it to 100° C. on two successive days. The flask can then be plugged, and on steeping it in warm water its contents become fluid, and are ready to use. For local application he uses a five to ten per cent. solution in a 0.7 per cent. salt solution. Sirdey has also used it locally in metrorrhagia, bleeding from piles, epistaxis; and successful cases have been reported by others. Its action is rapid and lasting, and without danger. Poliakov reports a case of hemorrhage from gastric ulcer, in which six ounces of a ten per cent. solution given thrice in twenty-four hours stopped the bleeding. Bleeding from the lower bowel can be controlled by injections. Hæmoptysis does not seem to be much benefited by its internal administration.

Nogues has treated cases of vesical bleeding by injections of gelatin solution into the bladder. The viscus is first thoroughly washed out with boric lotion, and then several small injections

of a five per cent. gelatin solution are given; the bladder is again washed out, and is ultimately left partially filled with it.

The subcutaneous injection of gelatin to stop hemorrhage was first used by Lancereaux and Paulesco. Cases of hæmoptysis, hæmophilic bleedings, and bleeding from toxæmia can all be treated in this way. Several physicians have used with success a two per cent. solution in hæmoptysis, in bleeding from the bowel in typhoid, and in hæmophilia. As a rule, about six ounces is injected daily for several days in succession. In obstinate hemorrhage after various operations it is also effective, and it has controlled in several cases the bleeding of purpura hemorrhagica.

In cholemic bleedings Kehr states that three or four injections suffice to control the tendency to hemorrhage. His conclusions are: (1) A solution of gelatin increases the coagulability of healthy and pathological blood. (2) This occurs after local application and subcutaneous administrations. (3) It is harmless if antiseptic precautions are carefully carried out. (4) It can be used in all cases of bleeding from the most various causes. (5) Its value as a prophylactic before operation can only be established after further experience. (6) For subcutaneous injection a one or two per cent. solution is best; for local application, a five to ten per cent. solution at a temperature of 98° to 100° F. (7) It must be sterilized. (8) Heart and kidney disease contraindicate its use.—*Edinburgh Medical Journal*, July, 1900.

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held on Friday evening, November 9, 1900, at the residence of Dr. T. W. Onderdonk, No. 838 President Street, Brooklyn, N. Y., Dr. S. E. Davenport, of the Executive Committee, in the chair.

The minutes of the last meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

The secretary read the following extract from a letter which had been received from Dr. George H. Maxfield, of Holyoke, Mass.,

together with two specimens which were passed around. The specimens consisted of fillings composed of tin, on the surface of which gold had been burnished by means of ivory points.

"Last week we had a very profitable and enjoyable meeting at Providence. I think it one of the best we ever held in New England. The papers were of a high order, but as the programme was rather crowded there was not much discussion.

"I suppose you have heard of the clinic or demonstration that Dr. T. D. Shumway, of Plymouth, Mass., gave us at Springfield at our September meeting, of his method of combining gold and tin. We had him at Providence, and it created as much interest as anything we had there. I think it would well repay you to get him for one of your afternoon meetings. He tells me he has not demonstrated this since he has perfected the method, and that he would like the opportunity of coming before the Institute. I think it one of the best things brought out in dentistry for many years. Since he was at Springfield I have put in quite a number of these fillings.

"Dr. Stockwell says it has given him more enthusiasm than anything that has been brought out for a long time. He thinks it the most scientific and therapeutic of anything we have.

"I enclose a tooth which Dr. Shumway was showing at Boston. This cavity is filled almost to the edge with tin, and then the gold is burnished right on to the tin.

"I have filled a number of proximal cavities in incisors in this way. It is surprising what an affinity gold and tin have for each other. To demonstrate this I have a piece of pure tin about as big around as a cent and one-quarter of an inch thick. I filed a flat place in the edge and burnished on gold beyond the circumference, and then polished as in a tooth. Then on the flat side I burnished on quite a little knob of gold. All this burnishing was done with ivory points.

"As we know, tin is more compatible to tooth-structure than either cohesive gold, cement, or amalgam. By this method we get the therapeutic benefit of the tin and the beauty and wear of the gold. It is also much easier put in for both patient and operator. The ease with which it is done will surprise you. This method of packing the tin is quite an improvement on any other. It is surprising how solidly this is done by the use of hot instruments.

"If you do get Dr. Shumway, I am certain you will agree with me that it is one of the best things brought out since cohesive gold."

The Chairman.—Dr. Shumway's skill in the use of ivory points is known to be very great. These specimens are interesting in that they show the great affinity which the two metals have for each other.

Dr. G. A. Wilson.—Do we understand these fillings to be a combination of gold and tin?

The Chairman.—They are tin fillings over which gold has been burnished. They differ from the ordinary combination gold and tin fillings in that the gold and tin are not folded together before the material is inserted, but the pure tin is inserted first and the gold burnished on afterwards. If there is no further discussion upon this point we will listen to a short paper entitled "The Use of an Assistant," by Dr. Albert H. Brockway.

(For Dr. Brockway's paper, see page 75.)

The Chairman.—We have listened with great pleasure to Dr. Brockway's poem, and would be much pleased to have other stanzas added.

Dr. J. Morgan Howe.—It is always a great pleasure to hear Dr. Brockway, and it has been especially so this evening. His paper contains very valuable suggestions, and I wish to endorse what he has said about the advantage of having an assistant at the chair. I have had my own capacity considerably increased by such assistance, and in numerous ways my labors have been lightened. I would suggest, however, to those contemplating the adoption of that plan, and even to some who are accustomed to such help, that the presence of a third person looking at their dental deficiencies is objectionable to some patients. A minority of my patients, but still quite a number have shown a dislike to having an assistant near, and I think it worth while to humor their sensitive feelings as much as I can without inconvenience. Only a few days ago I got a letter from a gentleman asking for an appointment for the examination of his teeth, in which he wished it might be arranged so that there would be no observers of the conditions of his mouth excepting myself. I would also suggest that all practitioners should be alive to the feelings of their patients and not impose unpleasant conditions further than is required by the necessities of the case. Another suggestion is this, that one of the

chief uses of an assistant should be the cleansing and sterilization of instruments. The sterilization of instruments is not so generally practised as it should be, and must be in future. The necessity of it may seem doubtful to many, because of the rarity of unfavorable results following its neglect, but the most remote chance of conveying disease germs from the mouth of one patient to another must be eliminated, or the dentist neglecting such safeguards will be liable to suffer.

Dr. E. H. Raymond.—I have been very much pleased with the paper that we have heard to-night. We might adopt many of the suggestions made by our friend, and would find that our work would be rendered much easier by the employment of a competent assistant. Dr. Brockway undoubtedly has more detail work for the assistant to do than most of us would require, but this is a matter of education and individual necessity. Too much importance cannot be placed on the subject of antisepsis and the sterilization of instruments. Carelessness in this direction may lead to serious consequences. An effectual method is to have a tumbler half-full of hydrogen dioxide on the operating-case, and immerse the instruments in that after using them; then have the assistant wash them with hot water and soap.

Dr. J. A. Schmidt.—I have listened with pleasure to Dr. Brockway's paper, inasmuch as it was through his influence that I was led to the adoption of an assistant. I find my assistant's time is largely taken up with the cleansing of instruments. They are made mechanically clean and then are sterilized in a formalin sterilizer. It was but yesterday that the importance of sterilizing instruments was brought home to me when I forced a pair of pliers into the palm of my hand. The instrument being sterile, I had no trouble with the wound. The assistant also does good work in assisting in examinations, marking down the cavities on the chart as I call them off. In malleting gold they are invaluable, also in treating teeth and preparing dressings. I am sure I have found them a good investment, and I thank Dr. Brockway heartily for suggesting the matter to me.

The Chairman.—I take pleasure, gentlemen, in introducing Dr. George S. Allan, who will describe and illustrate "Boxings."

(For Dr. Allan's paper, see page 73.)

The Chairman.—Do you take the impression of the cavity with a cup or simply with a pellet of compound?

Dr. Allan.—I use a little Russia-iron cup roughly modelled to cover the tooth-cavity, and when contouring is required the adjoining tooth is also included. I sometimes chill the impression-material and sometimes I do not. Very frequently at the lower or cervical margin of a cavity I place a layer of gutta-percha. Then taking my impression, after the box is made I leave this portion filled with gutta-percha. This vulnerable point is then protected by a stopping of gutta-percha, which, when it is worn out, can easily be replaced.

Dr. Brockway.—I would like to ask Dr. Allan if, in case one had the proper equipment, it would not be as easy to make a porcelain inlay as one of these boxings.

The Chairman.—The Executive Committee has endeavored to ascertain if this method of filling teeth which Dr. Allan terms "Boxings" is entirely new. With that idea in view they have written to Dr. Head, of Philadelphia, and Dr. Ames, of Chicago. The committee has received the following letter from Dr. Ames, together with a number of reprints of the article mentioned:

"CHICAGO, November 2, 1900.

"In reply to yours of October 17, I cannot do much beyond sending to you some reprints of a paper which I read before the Chicago Dental Society in December, 1898, since which time I have changed my methods very little. The description here would be as I would give it to-day, except that I would make mention of inlays, burnished shoes, or what your essayist, I fancy, terms boxings, for the support of a part or of parts of a bridge.

"I have often preserved the face of a tooth almost in its entirety while shaping the posterior surface for burnishing an attachment which will satisfactorily carry a single tooth to fill a space or to serve as one abutment of a bridge having two or more attachments. A compound cavity can often be filled with an inlay which will satisfactorily carry a dummy to fill an adjoining space.

"I would also call attention to a simpler method of obtaining contours of inlays in cases where the color of the surface of metal is not an important factor. With a nitrous oxide or oxygen blow-pipe, or any blow-pipe giving a fine pointed flame of intense heat, small pieces or globules of refractory metal (alloyed gold) can be added to the surface of the nearly completed inlay at the points

which need extension, solder being used between and over these particles.

"I will only add that these operations continue to give me much satisfaction. I trust that in your discussion there will not arise the usual confusion of this solid gold inlay, with which the matrix is burnished into the cavity, and the shell affair which I have heard credited to Dr. Bing, of Paris, which, I should say, does not, from the nature of the procedure, give as promising a joint. I have several times heard gentlemen denounce gold inlays as untrustworthy, and immediately tell of having cemented gold-foil fillings into the cavity from which they had loosened from want of sufficient anchorage, with most satisfactory results, which simply proves that the secret of a trustworthy inlay is simply a proper plan and execution.

"Trusting that this will reach you in good season, I am,

"Yours truly,

"W. V. B. AMES."

Dr. Parker.—Fifteen or sixteen years ago I read a paper explaining a facing which, from the specimens shown, I should judge were identical with those of Dr. Allan.

The Chairman.—I think Dr. Parker is mistaken in thinking Dr. Allan's boxings are essentially facings; they differ materially from those described by Dr. Parker.

Dr. Raymond.—We are all under obligations to Dr. Allan for presenting to us such a unique method of reconstructing broken or decayed teeth. When I read the announcement of this meeting, and saw that Dr. Allan would describe "boxings," I was rather puzzled, not having heard that term in connection with dentistry. I certainly had no conception of the beautiful work which has been presented to us this evening, and did not realize that such results could be obtained by the use of gold plate. Although this is the porcelain era, it is gratifying to know that the gold standard is still in operation in this country. But while the results are so beautiful, from the doctor's description, it seems to me that such results cannot be obtained except by a process which is somewhat complicated and which would consume more time than most of us could well give to it. Will Dr. Allan inform us whom he employs to assist him?

Dr. Allan.—Dr. Leeming.

Dr. Raymond.—If we all could have the assistance of as skilful a man we might save our patients much discomfort by adopting this method, as it meets the requirements of a solid gold filling and the advantage of the non-metallic substance coming in contact with the tooth structure, in the cement which holds the “boxing” in place. A simple and quick method of filling a large cavity in a frail tooth with pure gold plate is as follows: after preparing and shaping the cavity and bevelling the edges, take a piece of sheet tin about 26 gauge and restore the contour of the decayed tooth as accurately as possible. Take this tin pattern, and after flattening it out duplicate in pure gold by placing it on the plate and marking its outline with a sharp point. Cut this out and with pliers and burnishers fit it to the cavity as was done with the tin, then solder one or more anchors on the inside of the cap (which it now becomes) and cement it in place with zinc phosphate. In attaching the anchors use 14-carat solder, which flows by holding over a spirit-lamp. The “boxings” are in every sense more artistic, but when pressed for time this latter plan will be found to give gratifying results. I congratulate the doctor on his new method and the Society on having the benefit of it.

Dr. Howe.—I would like to ask Dr. Allan whether these boxes which he makes are soldered together all around the margins so as to be air-tight when completed. I take it from what he has said that this is the case. If so, it is possible, having cut his holes in the bottom of the box, to fill it solid full of cement. It seems to me that it is similar to various methods of treating root-canals which have been described, of squirting the medicine into the canal without considering what is to become of the air. It occurred to me that the air would prevent the cement entering the box.

Dr. F. Milton Smith.—I have been very much interested in Dr. Allan’s description, and am delighted with the beauty and the workmanship of these boxes. As to the result obtained, I do not see that it is so different from that obtained in other ways. The principal thing which attracts me is that so much of the work can be done by one whose time is not so valuable as that of the “successful dentist.” If it is possible that we can turn over this work, that takes a long time to do, to a plate-worker, we have accomplished something. Dr. Allan is fortunate in having a man who can work to such fine lines. Dr. Allan has mentioned the inlays which were presented by Dr. Dwight Smith at the September meeting at

Dr. Davenport's. This work consisted simply in burnishing plate-gold into the cavity, forming a cup, and then filling with solder and grinding to get the contour. There is no doubt as to the durability of such inlays. The principal objection is the length of time required. There are several points connected with this work which go to make it successful, the principal one being perfect adaptation to the walls of the cavity. I think it would be very hard to find many plate-workers who would strike up from a die inlays which would be anywhere near perfect. These specimens are certainly most beautifully done. As to retaining them in place, the suggestion of making a hollow box in some respects is excellent. I hardly think Dr. Howe's objection would hold if the holes are sufficiently large. If necessary the box could be filled before it was set. I accomplish this in the solder inlay by drilling in from the under-side, making undercuts, and filling them with cement. The great point in all this work is that it shall absolutely fit.

Dr. Charles O. Kimball.—It seems to me that the suggestion of Dr. Allan is good and helpful. I can think of a great many cases in which it could be used to advantage. The method of making a gold cap described by Dr. Raymond is not like this of Dr. Allan. It seems to me that it has two marked points of usefulness. In the first place, it is tough as compared with a porcelain inlay. We all know of places upon which a great deal of the strain of mastication comes, and where we would hesitate to use porcelain because it is so brittle. A second point is that a boxing of this kind, filled as it should be, perfectly full of cement, would minimize the danger of the filling spreading under the strain of mastication. We must always remember, when we put in a crown filling which is intended to last for years, that the teeth are constantly wearing, and if we have a filling which will spread under the increased strain it may become imperfect and even split the tooth.

Dr. L. C. Leroy.—I should like to have Dr. Allan describe how he would prepare a filling of this kind for a cavity in a molar where there was a distinct undercut.

The Chairman.—It would seem possible, if the cement to be used in setting these boxes was of the slow-setting variety, that the interior of the box could be first filled with the cement through the holes referred to, and afterwards a portion of the cement be placed in the cavity and the box pressed to place. To the un-

initiated this method of Dr. Allan's would seem to have a great advantage over the thin facings with the loop underneath, in that the strain of mastication coming on the facing is liable to cause the edges to turn up, giving an opportunity for the cement to wash out. The rounded edges of the boxings would certainly obviate that.

Dr. Allan.—As to Dr. Brockway's question, which is a very proper one, the box is superior to the inlay of porcelain, first, because of its greater strength, and secondly, because a better contour can be more easily obtained. Dr. Howe's question has already been satisfactorily answered. As Dr. Davenport suggests, the box is first filled with cement, an excess being placed on the under surface, then it is pressed into place. The suggestion has been made that it is very complicated and difficult work. Now, I have once or twice been caught without my plate-worker, and have made these boxes myself without any impression. I burnish in the under shell and fill or contour out with wax while the patient is in the chair; removing this I strike up the outer shell, then, placing the two together with some little pieces of solder around the margins, heat in the Bunsen flame till the solder flows, after which trim the edges and polish.

As to Dr. Leroy's question, I have already stated that the cavity must be prepared so that the impression can easily be withdrawn. This simply means to fill all undercuts with modelling compound or cement.

The Chairman.—Will Dr. Allan explain one point? In making the box which he has just explained, does he leave an excess of gold on the outer shell, which is trimmed off after it is soldered?

Dr. Allan.—That is exactly what is done. The boxing when completed should fit the cavity perfectly, as perfectly as a good filling when finished ought to. Much care should be taken in pressing the boxing in place. No hard substance should be used, or the surface may be badly indented. The finger alone should be employed, or the broad end of a soft stick with a bit of spunk interposed. A good plan is to partly fill the boxing with cement and allow it to thoroughly harden before setting with a fresh mixture. The make-up of the boxing must be varied to suit individual cases. Of course, in all cases it must be fashioned so as to easily fall into its place. While the outer shell must fit closely the margins of the cavity, the inner shell need not and oftentimes

must not closely follow the outlines of the cavity. As an example, take a bicuspid having the mesial and distal faces destroyed and the two cavities meeting between the cusps. It is not difficult to so fashion the inner shell that without loss of strength to the whole it will when finished readily drop into place.

The annual meeting of the Institute was held on Tuesday evening, December 4, at the office of Dr. S. E. Davenport, 51 West Forty-seventh Street. The following officers were elected for 1901:

President, Dr. J. Morgan Howe; Vice-President, Dr. A. H. Brockway; Recording Secretary, Dr. F. Milton Smith; Corresponding Secretary, Dr. George A. Wilson; Treasurer, Dr. J. Adams Bishop; Editor, Dr. F. L. Bogue; Curator, Dr. J. G. Palmer.

Executive Committee.—For three years, Dr. C. O. Kimball; for Dr. Howe's unexpired term of two years, Dr. C. F. Allan.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

ACADEMY OF STOMATOLOGY.

A REGULAR monthly meeting of the Academy of Stomatology of Philadelphia was held at the rooms of the Academy, 1731 Chestnut Street, on the evening of Tuesday, October 23, 1900, the President, Dr. J. T. Lippencott, in the chair.

A paper was read by Dr. William H. Trueman upon the subject "State Dental Examining Boards and their Questions."

(For Dr. Trueman's paper, see Vol. XXI., page 784.)

DISCUSSION.

Dr. Kirk.—I regret exceedingly that a tone of partisanship seems to pervade the essay. In so far as the essayist has shown defects and evidences of occasional ignorance in the questions propounded by men who are appointed to examine into the qualifications of graduates, I think he has done a good work. To me he

seems to have told but one side of the story. He assumes that a condition of antagonism exists between the teaching bodies and those who have the function of examining the product of their work; that the latter are of necessity partisan in their rulings, besides being ignorant. On the other hand, it is assumed that the teachers are men of high attainment, high motives, and apparently infallible. From my experience, I deny that either attitude really exists. The examination questions submitted by the faculties of the colleges may be criticised quite as freely as those of the boards. While these questions are defective, and many are ludicrous, I think the essayist has been hypercritical. There are a number of questions cited which, while awkward, at least convey the meaning of the examiners, and I think the average student ought to be able to answer a large proportion of them.

Dr. Roberts.—Fortunately, so far as I can see, Dr. Trueman has not selected any of my questions. There are several things I would like to criticise in Dr. Trueman's paper. I can say positively that there is no member of the Pennsylvania State Dental Examining Board but that welcomes honest and intelligent criticism, and by such he is helped in the formation of his questions. A great many of the questions that are given, and which are queerly worded, are evolved from questions previously asked, which are simple in their form but have not brought out the answers desired, showing that the students did not understand the meaning of the questions. These questions have been repeated in another form, to try to convey the meaning and bring out the knowledge. That is very frequently done. It is also very difficult to go into any given subject a second time very deeply without either repeating the question in its exact form or varying the words.

The doctor says that the examiners are not called upon to lose time. During the first year I was on the examining board I lost six weeks, besides doing night-work from eight o'clock up to twelve and one o'clock. The compensation was a trifle over three hundred dollars.

I feel glad that the majority of students who come before us are better able to understand the questions than Dr. Trueman; in other words, we do not have many students to examine who criticise the papers and questions as Dr. Trueman has done.

In 1896 the National Association of Dental Examiners did attempt to rule the faculties, and in 1897 the Pennsylvania State

Board withdrew from the National Association, because, as it was then constituted, it could work in harmony with the various colleges of the State. I do not think there is a member of the board who has been active in antagonism against the colleges in the State Society, but that every member of the board has upheld the colleges of the State and their instruction.

The criticism upon the formation of the question, "How do you do so?" I think to be hypercritical. Where there are several ways, the examiner will desire to ask the question, why and how this individual would perform a certain operation or do a certain thing. Of course, the question can be put in a different way to get the same result; but the student understands, and the examiner finds out that he understands, what is meant, and I can see no objection to putting a question in that way.

The difficulty of getting the questions properly printed is a great deal more than any one who has not been through it knows. Apparently you cannot trust the public printer or his office. It is very difficult to get type-written copies of a sufficient number of questions without having grave errors in the type-writing. The last two sets of questions were printed by taking possession of a printer's entire outfit, and standing over the compositor while he put the questions in type, printed them, and destroyed the proofs of his prints and distributed the type. Neither is it easy for one or two persons to control the wording or punctuation of a set of questions that another man may give. No one can appreciate the difficulties that an examining board has to encounter until he has been through it.

I was glad to hear the doctor's paper, glad of his criticisms: it will do good, but I think he has been unjust.

Dr. Cryer.—I would like to have heard from Dr. Huey as a member of the Pennsylvania Examining Board. The members of this board were attacked very bitterly as to ignorance and otherwise. I do not remember the exact wording. For my own part, I do not like these questions. I would not like to be examined on that set of questions before us. I do not think they are fair. At the same time, I believe our own board to be honest, fair-minded, and just. They are in harmony with the teachers of the different institutions of our stated society meetings. In his criticism of questions I think he is right. Questions should be plainly put, so that students may understand.

Dr. S. H. Guilford.—I admire Dr. Trueman's industry and self-sacrifice as displayed in the preparation of this paper. He has not only given us a very full explanation of the subject, but he has treated it, as he usually does, in a very full and satisfactory manner. There is but one thing I would criticise, and that is the implication of antagonism between the colleges and the State board. There is really no antagonism of that kind. The colleges, so far as I am acquainted with them, are in perfect sympathy with the State board, and the State board has been perfectly just, upright, and cordial with the colleges. The colleges, however, feel that when some of their students come back from the examinations bringing with them the papers containing the questions and ask what such and such a question means, and we have to say we do not know, because the question is so obscure, we do have the feeling that the students have not been asked questions in a proper way.

The matter to-night is not a question as to the integrity of the State board, nor as to any member of it, nor as to the motive back of it. Nobody doubts the power of any State to exercise its power or its care over the people of that State. The same State looks after the health of its citizens, sees that they are supplied with pure food, and that they are not subjected to the influences of any diseases that can be prevented. The establishment of a quarantine station is perfectly right, and to supervise the educational work of the State is right. The only thing is, How should that duty be exercised? The colleges, if they do their duty, have nothing to fear from the examining boards, no matter where they are. If the students are properly trained, they ought to be able to go before the examining board, answer questions, and pass with credit.

There is no question in regard to the fairness of the board. It is simply a question, How shall the State exercise proper superintendence over the welfare of the people? At the present time the best plan seems to be the establishment of dental examining boards. If it prove successful, it will probably be continued. If it happen to fall short or be unsatisfactory, it will have to give way to something better. The work is going on satisfactorily in every way: but, as I said before, there are certain objections to the way in which the examinations are conducted. It is too large a question to go into to-night. Excellent men have been

selected in our State, and they are doing their full duty. Whether the present spirit of good-will between the board and the colleges will be kept up, or whether in the course of time political influence may creep in and create antagonism, we do not know. If the latter should occur, some new plan will have to be devised to direct the educational work of the State. Still, let us uphold the present law and give it a good, fair trial. If it has merit, it will stand; if it has not merit, it will fall.

It is hardly necessary to add to the list of questions that have been presented. I have a number here that I have gathered, but the hour is too late to read them.

The trouble with the examination questions, as Dr. Trueman has said, is this: Very frequently they are framed from the standpoint of the individual's own experience. They are not broad enough. A practitioner will have a certain way of performing an operation, or believe that a certain course is the right one to pursue, and will ask a question to bring out that idea, which may not be held by many others. It is simply due to the fact that the gentleman has not been broadened by reading, culture, and experience. When individuals who are not men of intelligence and culture do get on the board, and they frame questions in such a way that they are hard to be understood, it makes the college professor feel a little sore, because he feels that the student has not been justly dealt with. It seems a little anomalous that the same law which requires that the student shall have a fair English preliminary education, and that he shall pursue a college course for three years, should require that he shall after graduation come up for examination before men who in some cases have not had even a grammar-school education, and who, in the framing of questions, violate more rules of rhetoric than would a fourth-grade grammar student.

Dr. Darby.—The President has asked me if I could not pour a little oil on the troubled waters. I do not think any is needed. I have been greatly amused, because every man who has spoken was afraid that he had said too much or not enough. I believe Dr. Trueman has done just what he thinks is right, and I believe that the examining board has done just what it thinks is right. I do not think that Dr. Trueman criticised the examining boards as a whole, but he did criticise, and I think justly, the questions that some of these examining boards have put. It is absurd to suppose

that any man could answer some of the questions as shown by Dr. Trueman; and when Dr. Roberts said that questions are put, and then, because they are not answered, another question is put to draw out the question asked, he is in error, because all these questions are printed and submitted to the student. If I were examining a candidate there orally, and asked a question that he did not comprehend, I might put that question in a different way, but if I submitted to him a printed examination, and he submitted a written answer, that would end it for that examination, would it not? I ask for information.

Dr. Roberts.—Yes.

Dr. Darby.—I have no desire—far from it—to criticise the examining boards. There may be incompetent men on the examining boards of all States. So far as my own knowledge goes, the State of Pennsylvania is fortunate in having competent men on its examining board. I believe it is honest, and I do not believe that the colleges are at variance with it; but it is quite possible that a candidate cannot answer a question correctly because he cannot understand the question. It is not always an easy matter to ask a question that every candidate will comprehend, even though it may be an intelligent question and grammatically formed; but when you put to a man questions that have no sense, and then expect him to give you an intelligent answer, the examining board is at fault and not the candidate. We should judge an examining board as it deserves, but not criticise disparagingly the student because he cannot answer questions that are illogical.

Dr. Roberts.—I would like to explain, as I have apparently given a wrong impression as to the evolution of the question. If a question is put in one examination and the examiner desires to bring out a certain point in the answer by the student, and he finds that the majority of his answers do not bring that out, but that the students have taken another meaning, he will repeat the question at a subsequent examination, in a different form,—that is, if he have the same object in view that he had at first. If they have answered it according to their understanding, they are marked as they understand it, not necessarily as to whether it is the expected answer, but whether it fits their interpretation of the question.

Dr. Kirk.—I would like to say one word more. What I had to say in the beginning was with the desire to see fair play in this matter. We are inclined, I think, to take a great deal of

pleasure in getting at the weaknesses of our fellow-men. See at what a tremendous disadvantage the examining boards are placed in a case of this kind. The examinations by dental educational institutions are not matters of public record, while those of the dental board are so by law. My plea is that we should investigate both sides. Let us not attempt to pick the mote out of our neighbor's eye until we have done something with our own little beam.

Dr. James Truman.—I did not want to say anything on this subject to-night, but I cannot let the matter drop, late as it is, without placing myself on record in a different way from what has been stated by my colleagues connected with dental education. I am not in harmony with the State boards, nor have I been for many years. The subject is too large a one to enter upon. I simply wish to make that assertion, without arguing the question. I do want to say, however, this much, that criticising questions is not my way of treating the subject, and so far I am in opposition to my friend, Dr. William H. Trueman. Some years ago the State boards began this kind of work. It started in New Jersey, and one of the members of that board travelled over portions of the United States giving the answers of the students, and tried to make them ridiculous. Now, we have the opposite side to-night, but nothing quite equal to that made by the member of the New Jersey State board.

Of course, we know that there are defective questions both in the colleges and the State boards, and more likely in the case of the State board than the colleges, but there is no class of men absolutely free from error in that direction.

There is a deeper meaning beyond this, to my mind, that has never as yet been answered. Are they doing any good work for the general public? I contend that they are not, that they are not preventing incompetent men from practising. Take our own State. Has there been, in the last half-dozen years, any man brought up before the courts for practising without a license? If there has been, I do not know it. It was not done by the State board, by individuals not members of the State board, by this organization, nor by the State Society. Consequently any individual, so far as I know, could commence practice without any license from the State board. Is that protecting the people? Certainly not, as I view it. As it is at present organized, the whole thing is truly a farce.

What we want to know is, what kind of men we have on State boards. I am perfectly satisfied with the honesty of the Pennsylvania State board, and with their ability, so far as I am competent to judge. Is it the proper method of selection to take a man because he is a member of the State Society of Pennsylvania and place him in the State board, nominating, and then the governor appointing him? We want to know exactly what these men are capable of doing, and until this is done properly we will probably have in general poorly organized State boards. They are not in harmony with the colleges; there can never be any harmony while such a difference exists between their methods of doing things and those of the colleges.

Dr William H. Trueman.—I wish, Mr. President and gentlemen, to state distinctly and emphatically that I am not opposed, *per se*, to State dental examining boards. Our country is large, and naturally has within its bounds communities that differ widely on educational, as on other matters. We have dental colleges scattered all over the land, and, as is right and proper, these colleges cater to the needs of the communities they serve and from which they draw their support. It is, I take it, practically impossible, and perhaps undesirable, that they should all have the same course of study and the same standard. All of these colleges doing honest work are justly entitled to be considered "reputable," and their diplomas, as diplomas, are equally entitled to respect, notwithstanding that their standards may widely differ.

Now, it is the right of the State to make its own standard, and to say whether or not it is satisfied with a diploma from a dental college, regardless of its source, or to regard a diploma as a certificate entitling its holder to an examination only, or to depend exclusively upon its own agents, the State examining board, to determine the applicant's fitness to practise dentistry within the commonwealth. As things are, the States act wisely, I think, in supervising this matter.

I criticise the boards when they go beyond this and forget the purpose for which they were legally ordained. This they have done. They retain and display to a controlling extent the commercial spirit which, as I have endeavored to show in my paper, gradually crowded out the noble motive that first called them into being. Explain it as you will and mask it as you may, there is an antagonism between the examining boards and the educational

institutions. In proof of this I refer you to our periodicals and to the reports of our professional societies, local, State, and national; to the numerous articles and reported discussions they contain attacking these institutions from a commercial standpoint. Some declare their sentiments guardedly, others bluntly. Our plain-spoken friend, Dr. Crouse, tersely states his when he says, "There are at present more practitioners of dentistry than can make an honest living," and holds the colleges responsible for this. (*Dental Digest*, vol. iv., June, 1898, p. 435.) Men who hold such views select the men placed on the examining boards; they select men holding like views with themselves, and look to the examining boards to remedy this state of affairs by making the examinations severe. When I say that there is an antagonism between the examining boards and the educational institutions, I do not mean that there is a personal animosity between those composing the boards and those interested in the dental colleges; there is doubtless very little of this. I refer to the spirit which prompted the remarks I have quoted from the report of the Dental Council of this State. It is a reflection on the colleges as uncalled for as it is out of place. I refer to such actions as that of the New Jersey State board in sending out quotations from absurd answers they had received from applicants who had appeared before them, and that of the same board in collecting and exhibiting at dental meetings the failures in laboratory work—in many instances, no doubt, the result of the applicant being compelled to work with unfamiliar and imperfect tools—as specimens indicating the imperfect training students received in dental colleges. I refer, also, to the derogatory remarks applied to dental colleges by members of examining boards. As individuals, the members of the boards may disclaim this, they may not feel it, while at the same time as members of the boards they are doing their share to keep it up. There are in the United States many State boards, and doubtless there are many serving thereon to whom this criticism does not apply; there are others, however, who have placed themselves unmistakably on record, and to these it does.

As I have stated in my paper, whether an examination serves its intended purpose depends upon those who conduct it. Now, I ask you seriously, Can any one, however honest he may be, conduct a proper examination on a subject he does not himself understand? An important part of these dental examinations depends

upon the questions. Look at these I have placed before you. Do they indicate that those who wrote them understood the subjects to which they apply? It is no excuse to say that professors in dental colleges make the same blunders. The State examinations are defended on the ground that the college examinations are not thorough. If the State examiners are not better examiners than the college professors, what good purpose do they serve? Permit me to ask, What care is taken to get competent men on examining boards? Is the qualification of the candidate for this position canvassed at the State society? Is any care taken to select educated men, men who are well posted in current dental literature, who are in touch with the instruction given to dental students, and who are familiar with the teaching of our latest text-books?

There has been too much of the star-chamber methods in examining board business, and too little supervision of their work. Do you think for one moment that the author of any of these questions would have so written them, knowing that they would have been placarded and criticised, as they have been to-night, before a prominent dental society? On the other side of the sea the examination questions have been published for years, and the examining and the educating bodies call attention to them, advising students to procure and carefully study them, that they may know the lines upon which they will be examined at the end of their course. I present to you several sets officially published by the College of Surgeons of London, for the use of those intending to apply for membership, or for a license to practise surgery, or dentistry. There is nothing to be ashamed of in these questions. I commend them to your notice. There is no necessity for repeating questions so often that their publication vitiates the examination. Each branch of dental science is broad enough to furnish proper questions for many examinations. The plea that their publication would lead to making the course of instruction a mere "cramming" for the examination will hold good only when the examiner is a mere catechist.

This matter of State dental examinations is, I fear, far too lightly considered. It is the final act of initiation into the profession, and should be conducted with dignity and decorum. The applicant, whether a recent graduate or a practitioner seeking a new field, here meets for the first time, officially, the representatives of the profession in the commonwealth. He is there to be exam-

ined. While the examiners are taking his measure, he is quietly taking theirs. While they are deciding whether he is fit to be their associate, he is asking whether they are fit to be his. I tremble for his answer, as he unfolds and carefully scans the examination papers placed before him. Is it an error, gentlemen, to insist that they shall be in wording, in punctuation, in grammatical construction, in scientific accuracy, and in directness, befitting a learned profession? Is it hypercriticism to complain when they are not so? Am I unjust to the examiners in declaring that these carelessly worded questions are a disgrace to the profession, and that they convert what should be a dignified proceeding into a mere farce? I call the attention of the profession to this matter,—that is the purpose of my paper,—and I ask, Are you satisfied with the examinations as they are now conducted? I ask you to compare the results for good and for evil to the profession and to the community. Considering the turmoil they have caused, and their disorganizing influence in our professional societies, if we cannot find men able to conduct them in a more dignified and proper manner than they have been, better by far let the farce end.

Adjourned.

OTTO E. INGLIS,

Editor Academy of Stomatology.

Editorial.

THE EDITOR WAS TIRED.

IN the announcement of the suspension of the *Indiana Dental Journal* the editor gives the above pathetic reason for closing up the work to which his life had been devoted for the past three years. He characteristically remarks, "We announce the suspension of publication of the *Indiana Dental Journal* with the close of Volume III. . . . Further publication is suspended because the editor is tired. . . . It was conceived, started, paid for, conducted, and edited by two dentists for the first two years. No other persons, no firm, corporation, association, municipality, or government ever had any interest, real or otherwise, in its publication. . . . But the grind of it! Some of those thirty-six numbers were

put together on the train. Editorials were written in various hotels at numerous places. Sundays, that should have been devoted to pious meditation, were sacrificed to editorial work, and evenings that might have been profitably used for sandpapering the intellect were immolated on the altar of original communications."

This somewhat humorous valedictory contains so much of truth that the serious side of it will appeal to every editor. The eternal grind is forcibly and truthfully described, and has been the experience of every conductor of a journal.

It is with more than the usual feelings of regret that this, one of the best on the list of exchanges, has been forced to the wall. The editor was no doubt tired, but if we may be permitted to read between the lines, there was a deeper reason underlying this sacrifice, and the editor, if so disposed, could have added something to our knowledge of journal publication had he given his readers the facts.

It is no new thing in the experience with professional journalism, that ventures are started and speedily find an early grave, and while this is being written the oldest dental journal is understood to have succumbed to the tide that waits for no man or journal, but engulfs many sooner or later, unless governed by that propelling and supporting force, capital, to which must be super-added an energy that will overcome all resistant obstacles.

It is not always true that the fittest survive. The weaklings are many, and, like their human prototypes, they pass through the diseases of childhood, and, while they may never reach a maturity of strength, manage somehow to live.

The journalistic craze seems to attack individuals and societies periodically. Exactly why this almost overpowering idea possesses some it is difficult to tell. In many instances it is inspired by an ambition to be an editor; in others it is the growth of a feeling that the society or section of country should be represented in the literature of their profession, whatever that may be.

This in one sense is a laudable ambition in that it aims at progress, but unfortunately this is not usually the result, for every new effort of the kind simply dilutes the material within reach, thus lowering the literary standard of every periodical.

The establishment of a journal should be based on an absolute want. It should represent something, or it has no reason for

its existence. In dentistry it is not difficult to comprehend why a supply house feels the need of an organ to advertise its wares, and because of this, dental journals have sprung up everywhere, all claiming to represent the dental profession. In order to make this appear they have engaged well-known men to act in the editorial capacity, and then circulating each issue without regard to subscription-lists. That this meets their needs is evident from their growth, but it is absurd to speak of these as dental journals. They represent trade and nothing else, and their use of the dental name would be an imposition upon their readers were it not for the fact that those who take these journals have but one object, that of reading the advertisements. All of these journals must not be classed in the same category. There are three or four that aspire to be something more than mere trade organs and have succeeded in maintaining a reputation based on their dental and literary qualities, but these are exceptional.

If there are any indulging the hope that in the near future they may be able to launch a journal upon the world of dentistry, we would earnestly ask them to consider the wrecks of the past and then submit their plans to some one of experience.

A successful journal is a serious burden even where the finances are most satisfactory. The editor is always tired. The monotonous round of copy, proof, and original editorial work that must be prepared; the labor that is never finished; the months that have passed to be succeeded by other months of toil; and then, the misery of it all, the critical man always regards the editor as a shining mark for his best barbed shaft. Were this always the tired editor's reward, life would be intolerable, but the compensation comes occasionally, very occasionally, when some generous soul will write a pleasant epistle of appreciation of the editor's work.

The truth is, that we have in dentistry too many journals of a certain character, and altogether too few of the recognized organs of the profession. In fact, so far as known, there is now only one in the United States. There was a time when three existed, but necessity, which recognizes no law, has driven two of these into the hands of the dealer in dental wares. The reason for this is that there is no such thing as a true dental profession. Did this exist, there would not be any difficulty in having more than one journal to minister to its needs. The apathy of dentists to the

interests of their calling is simply appalling. Were it not for the fact that there is some hope for a better state of things through more enlarged intelligence, those who have struggled to bring about a higher professional life would retire discouraged.

It was a noble effort on the part of the two dentists who kept the *Indiana Dental Journal* alive for two years, and they deserved a better fate; but it is no new experience, and as time passes there will be other sacrificial victims upon the same altar, for human nature is the same at all periods, and the sad experience of one seems only to serve as a stimulus to further efforts to reach the same melancholy goal.

MONUMENT TO THE LATE DR. BEERS.

THE *Montreal Daily Witness* advocates the erecting a monument to the late Dr. Beers. This has no connection with his reputation as a dentist; indeed, that part of his life-work seems to have been a very secondary consideration, if it has been regarded at all. The notices in the press of Canada of the death of Dr. Beers seem to regard him from the stand-point of the patriot and athlete, or, as the *Witness* puts it, a "good man who did much for Canada and the Empire."

This, from a national and local view, is the only position that could possibly be taken; but has not Dr. Beers a stronger claim on the dental profession of Canada than he had upon the general public? A monument, not in marble or granite, but more enduring, might be raised as a memorial to him by his profession throughout the Dominion. It is not for this journal to suggest its character, but something might be done to show a professional appreciation of his work.

The Canadian journals have much to say of Dr. Beers's address before the New York State Dental Association, October 25, 1888, and the *Fredericton Gleaner* regards this speech as one that "crushed through the sophistries and delusions of people in the United States and some few in Canada." It is not surprising that this address created an enthusiasm throughout Canada and is now recalled there with pride. It was truly a scathing denunciation of a nation upon its own soil, but then Dr. Beers was nothing if not courageous where his convictions were involved. Unfortunately

for the comfort of his auditors, there was a good deal of truth mingled with partisan error in that address, and neither have much force at the present time. While there has not been much advance in the "true grandeur of nations," in the twelve years since that address was delivered, the idea is slowly growing that the detestable motto, "My Country, right or wrong," has fewer adherents than at that period. It is to be hoped that the people of Canada will erect the proposed monument, for by so doing they will honor a man true to his convictions, and where one such is found and lost he is worthy of the most appreciative remembrance.

Bibliography.

STUDENTS' EDITION. A PRACTICAL TREATISE ON MATERIA MEDICA AND THERAPEUTICS, WITH ESPECIAL REFERENCE TO THE CLINICAL APPLICATION OF DRUGS. By John V. Shoemaker, M.D., LL.D., Professor of Materia Medica, Pharmacology, Therapeutics, and Clinical Medicine, and Clinical Professor of Diseases of the Skin in the Medico-Chirurgical College of Philadelphia, etc., etc. Fifth Edition, thoroughly revised. T. A. Davis Company, Publishers, Philadelphia, 1900.

The author in the preface to this edition, says of it, "The experience of the author in the class-room has led him to make a change in the scope of the fifth edition. So many new remedies from the chemical laboratory and from the vegetable kingdom have been introduced during recent years that he had decided to divide the work into two independent issues, one (the present) to be known as the Students' Edition and the other, which will be forthcoming shortly, as the Physicians' Edition." This is certainly a wise discrimination, for most works on materia medica and therapeutics, where intended for both classes, fail to satisfy either, for with the student they cover too much ground, and for the practitioner they are not sufficiently extended.

Part I. concerns itself with "General Considerations concerning Remedies and Systems of Therapeutics," and exhibits such a liberal spirit that the author's opinions are worth quoting. "In order to

avoid misapprehension, it may be proper at the outset to explain that in the present treatise this system of scientific, or so-called 'regular,' medicine will be followed. Scientific, or regular, medicine is quite distinct from any school or sect in medicine, and is equally separate from so-called 'allopathy' or 'allopathic practice.' As every educated physician knows, there is a radical difference between 'an allopathic doctor' and a 'regular practitioner,' inasmuch as one is sectarian and the other non-sectarian. In point of fact, at the present day there are no allopathic physicians, and, of course, no 'allopathic' examining boards, and all followers of scientific medicine should resent the application of such a sectarian title to designate the regular practice of medicine.

"At the same time that we discard restrictions as to therapeutics and claim the right to employ whatever remedial means experiment and observation lead us to believe will benefit our patients, it should not be forgotten that the knowledge at our command is derived from various sources, and if we are willing to acknowledge the indebtedness of modern medicine even to native tribes for many useful remedies, we should not be above admitting the fact that useful lessons may also be occasionally learned from followers of exclusive schools of medicine, or so-called irregular physicians. 'Every judicious physician,' says Dunglison, 'must be an eclectic' in the sense that he selects from every source the best means of controlling disease." Whether this broad foundation will suit all classes of medical thought is doubtful, but that it is a true position to take accords with that advanced therapeutics that appeals to liberal practitioners. It is difficult to understand why any method of treatment should be rejected simply because of its origin, or why credit should not be given, even though that may bring some degree of credit to what may be regarded as empirical practice. When therapeutics has a basis upon absolute science, it may then be possible to repudiate those methods that have a somewhat discreditable origin, but until then everything should be used that corresponds with good judgment.

Considerable space is properly given to "Pharmacy." This is followed by "Prescription Writing and Formulæ." This is clearly written, and the student should not experience difficulty in following the author. In this chapter and throughout the book the metric system is given the preference, hence in all formulæ the prescription begins with the amount to be used in this system,

with the equivalent in apothecaries' weight. This materially assists in bridging over a difficulty experienced by all in transferring the thought from one to the other, especially when long habit has made change from one system to the other one requiring considerable study and practice.

This book has not been prepared to meet the needs of dental students, and hence the therapeutics necessary for these will not be found upon its pages, but, when intelligently trained, these should have no difficulty in making proper use of agents described. It is noticeable, however, that when the author steps aside to give any opinion upon dental matters, which he rarely does, he seems to fail to measure to his generally good standard. For instance, we find him stating that "Caries of the teeth may be relieved by a mouth-wash containing carbolic acid or phénol-sodique, well diluted." Dental patients and, at times, dental practitioners, would be delighted if caries could be benefited by this simple process, but that time will never arrive through the use of any mouth-wash.

In the article on "*Barii Dioxidum*" it is stated that hydrogen dioxide, "when pure and of official strength, is free from irritating qualities, and can be poured over wounds, injected into sinuses or into the ear, or used as a spray in ulcerations of the pharynx and larynx." This seems to the reviewer to be given altogether too wide a use for this agent, and without qualification would lead the student to regard it as a very harmless agent, whereas, if injected into cavities with small outlet there may be produced serious harm, and then it is very difficult to keep hydrogen dioxide down to proper strength. Those who have had extended experience with it have an increasing dread of using it as furnished by the manufacturers. The reviewer has observed quite serious results following its use without care in noting percentage in strength.

Again we find the author falling into an error, wherein he says, "It [hydrogen dioxide] enables the dentist to treat and fill, at the same sitting, a sensitive pulp or cavity." Exactly how a sensitive pulp can be filled has not yet been discovered by the average dentist. It is presumed, however, the author means the pulp-canal, and this is probably a typographical error; but the use of this agent does not enable the dentist to fill that canal at one sitting, although, if properly used, it is one of the best antiseptics to effect that object in, possibly, repeated sittings.

In the article on "Cinchona" the author says of quinine, "A one per cent. solution of quinine sulphate is recommended as a topical treatment of sluggish, unhealthy, infected wounds." This entirely coincides with the reviewer's experience, as he has used it with decided results in the treatment of pyorrhœa alveolaris.

Under the head of "Naphthol," the author expresses very positive opinions regarding this agent. This accords with his earlier published views, as he was one of the first to recommend it as one of the best and safest antiseptics. He says of it here, "It is one of the most powerful antiseptic agents, possessing three times the strength of carbolic acid or iodoform and four times that of creosote or naphthalin. It may be regarded as absolutely safe, since, according to Professor Bouchard's investigations, nearly half a pound would be required to cause death in a healthy person weighing one hundred and fifty pounds." The author does not regard hydronaphthol anything more than "an impure form of beta-naphthol."

It is unnecessary to follow this interesting and valuable publication throughout. Arranged to meet the wants of the medical student, it should be to him an invaluable aid, and doubtless this has been the experience, as the demand for a fifth edition testifies more strongly than words.

A PRACTICAL TREATISE ON ARTIFICIAL CROWN- AND BRIDGE-WORK AND PORCELAIN DENTAL ART. By George Evans, Lecturer on Crown- and Bridge-Work in the Baltimore College of Dental Surgery, etc. Sixth Edition revised. With six hundred and fifty-one Illustrations. The S. S. White Dental Manufacturing Company, Philadelphia, 1900.

It would almost seem an unnecessary duty to review this well-known and well-appreciated work, for the fact that it has reached a sixth edition is quite sufficient testimony to the estimate in which it is held by dentists everywhere.

In the preface to this edition the author expresses himself in no uncertain terms in regard to one of the worst features of crown- and bridge-work,—that of mutilating teeth in order to place crowns, when under older methods these could have been filled. The temptation to crown has been, in the opinion of the reviewer, one of the debasing results of inartistic modern dentistry. The author says, "Practitioners of to-day seek methods which will permit the

attainment of the desired results in crown- and bridge-work without the devitalization of pulps, with the least possible mutilation of the natural teeth and the smallest exposure of metal, and which are least complex in construction. These ideas have largely influenced the conduct of the revision of this edition."

There is, probably, no branch of dentistry that has shown greater progress than this of crown- and bridge-work. The present practitioner of dentistry does not have to be a very old man to remember when a crown was an unknown quantity in modern dentistry, but, if we are to credit history, it was not unknown to ancient civilizations. Although so few years have elapsed since crown introduction, we have this book of Dr. Evans, a pioneer in the specialty, covering the ground so thoroughly that it would seem impossible to make any valuable additions to the mechanical construction. Whether the dentistry of the future will tolerate bridge-work remains for time to determine. There seems to be a growing sentiment in opposition to it. Its mutilation of teeth and the contamination of the breath in permanent bridges being factors in causing much opposition.

The author very properly objects to the indiscriminate devitalization of pulps, for he says, "An examination of the investing membranes of pulpless teeth, as treated generally, shows the existence of a percentage of abnormal conditions, by which their firmness is to some extent impaired, their susceptibility to acute inflammation increased, and their reliability as foundations for crown- and bridge-work greatly lessened when compared with teeth which have living pulps." There can be no question as to the truth of this.

The first part of the book is devoted to treatment, and the real subject-matter, that of crowns, begins with Part II., "Artificial Crown-Work." The various crowns in use are here thoroughly described with methods of manufacture. There should be no difficulty in following the instructions of the author. The very perfect illustrations make any doubtful points in the text perfectly clear. A very moderate degree of knowledge in the working of metal should enable the beginner to succeed by closely following the minutely detailed explanations.

Part III. opens with "Bridge-Work." The author is as careful here as he has been in previous chapters to give all well-known methods. The student of this branch has, therefore, no need to

wade through much of the literature of the subject, but will find all methods clearly explained and illustrated. In some respects the author's tendency to a fair exposition of the work of others leads him to describe and illustrate specimens of bridge-work that should, in the reviewer's opinion, never be placed in the mouth. In the earlier period of this branch of practice, extremists placed entire dentures on, possibly, four roots. That this was wrong practice has been amply demonstrated by experience. The author advocates the sectional system.

Porcelain inlays have assumed increased importance of recent years, and the author devotes a chapter to "Porcelain Dental Art," in which he includes Dr. N. S. Jenkins's "Low-Fusing Porcelain" and method of working, as well as others of recent date.

The book, as presented in this edition, is certainly one of the most valuable additions to the literature of this portion of prosthetic dentistry produced at the close of the century. While there is a natural aversion to bridge-work in the minds of many operators, in which the reviewer shares a degree of sympathy, it must be said of it that it saved mechanical dentistry from utter ruin through the introduction of rubber as a base for artificial teeth. From that period the working of metal became almost a lost art in dentistry. Crown- and bridge-work necessitated a high degree of mechanical skill, and obliged dentists to acquire ability in this direction or suffer loss in practice. To Dr. Evans is due a large share of credit for the rehabilitation of this skill in metal working.

To those who need this instruction and those who have already acquired skill in this work, this book will be of great service, as one to which constant reference may be made with satisfactory returns for the labor given.

The work is rich in illustrations and entirely satisfactory in general make up.

PRINCIPLES AND PRACTICE OF FILLING TEETH. By C. N. Johnson, M.A., L.D.S., D.D.S., Professor of Operative Dentistry in the Chicago College of Dental Surgery. With Illustrations. The S. S. White Dental Manufacturing Company, Philadelphia; Claudius Ash & Sons, London, 1900.

The author of this book evidently felt when preparing it that a work on operative dentistry was not a crying need, for he says,

in his introductory, "The thought of the profession in recent years has been too active along those lines for any one individual to claim much in the way of originality."

The book, very properly, opens, Chapter I., with "Deposits on the Teeth." This is the orderly way of beginning operations upon the mouth. First, free the teeth and gums of all deposits, for, as the author states it, "It matters not how beautiful or how perfect an operation may be under these conditions, the work should never be considered as ideal service."

The first thirty pages are taken up with this subject, not too much when its importance is considered. This is followed by "Dental Caries," in which the author simply follows Black and Williams, and has very little to say of Miller's work. He gives Black credit for "calling attention to the fact that this acid (micro-organic product, Miller) must be formed and allowed to act immediately at the point where the decay was to begin." This discovery, if it be such, does not belong to any modern writer, for it is almost as old as dentistry. The point of impact with resulting acid was always understood. This loose way of writing history needs correction.

The author assumes, with Black, that the gelatinous plaque of Williams has been proved to be the product of micro-organisms, and that under or through this, the organisms produce the acid immediately destructive to the enamel. This has never been proved by Williams, or any one else, so far as the reviewer is aware, remaining simply a plausible theory.

The preliminary operations for filling are well described, but the author evidently has not had much practical experience with napkins used to prevent moisture entering the cavity. Skill in this direction belonged to an earlier generation, and is practically a lost art with present operators.

In the "Classification and Preparation of Cavities," we have presented the "extension for prevention" idea of Black. The author says of this, "If, in the preparation of a cavity, we limit the area to a small round outline, we have left unprotected, at the points indicated, more or less of the surface of enamel. With the same conditions present and the same influences at work which originally induced decay, there is little to prevent a recurrence. The remedy lies in so extending the outlines of the cavity that the margins are carried to a point where they will be kept clear.

This process has been termed 'extension for prevention' by Dr. G. V. Black, and its observance must be insisted upon where the most permanent work is required." To demonstrate this the author gives three illustrations. The first carried the extension to the gingival border in diagrammatic lines. If this be the explanation of extension for prevention, the less the dental profession has of it the better. If the reviewer understands it, a pin-head cavity on a proximal surface of an incisor must be enlarged until it extends to, or under, the gum border. This means placing the upper border of the cavity at a point where it will be constantly endangered by acid secretions. The author later on gives a reason for this curious operation, which is even more fallacious than the operation itself. He says, "The reason for this extension is the well-known fact that wherever we have the gingival portion of a perfectly inserted filling, covered by healthy gum-tissue, we will never have recurrence of decay at that point." Again he says, "No tooth may be considered safe from recurrence of decay around proximal fillings unless the gingival wall has been covered sufficiently root wise to bring that portion of the filling under the gum."

In the treatment of other proximal cavities the author says of a certain class that the "rule should be to open the cavity to the occlusal surface." In other words, if the cavity presents on the proximal surface of a premolar or molar tooth, the dentist should not rest satisfied with preparing the cavity as it stands, but must cut away and make a cavity on the occlusal surface. Such advice is not only contrary to accepted methods, but is radically wrong from every point of view except that of extension for prevention.

In the formation of cavities preparatory to inserting fillings, the author has this to say: "As the gingival wall joins the buccal or lingual wall, it should form a distinct angle in the axial region, but should execute a short curve at the enamel margin. . . . When shaped, as first outlined, it affords a base upon which the filling may be built without danger of the gold rocking under the plugger-point." This, as described on paper is an excellent theoretical form, and if always possible would be a solution of a difficulty, but teeth do not always decay to suit the dentist, and he is forced to prepare the cavity for each individual case, a filling properly anchored should never rock; in fact, the first piece of

gold should be as stable as the last, and this is quite possible of attainment, possibly by the author's method, and certainly by other systems.

The author has not much faith in cataphoresis or other methods for reducing sensitive dentine, and sums up the whole question by stating that the management of this "resolves itself to the following summary: Manipulative skill on the part of the operator, tact in knowing how to control the different temperaments among our patients, and the invariable use of the keenest, sharpest instruments." This is not very encouraging, but it contains many grains of truth.

The author does not regard the conductivity of gold as a deterrent factor in its use. He says, "Gold has frequently been severely censured when the brief factor at fault in the case has been the presence in the cavity of a hypersensitive mass of decalcified tissue, which should have been removed in the preparation of the cavity." This constitutes a serious arraignment of every operator who has made this charge against gold, and the number is legion. It is not true that masses of decalcified dentine are generally left in the cavity, and it is equally untrue that this mass is necessary to carry sensation to the pulp. Such a statement seems to imply a need of more intimate knowledge regarding the histological features of tooth tissues.

The author devotes but a half-page to the consideration of tin as a filling-material, and evidently is not practically familiar with the best methods of working it. This is unfortunate, for it has a place hardly second to any other material properly used and properly placed.

Inlays are not regarded with much favor. They are held to be "ephemeral" and not worthy to be classed with that work, "the result of hard, painstaking effort on the part of our illustrious predecessors."

In the use of mallet force the author has this to say: "One very great advantage of the softer mallets is that a much heavier mallet can be tolerated by the patient than if made of steel, and the condensing power is thereby materially increased without discomfort." This is a very great error. The heavy lead mallets do not increase condensing power. They lessen it; or, in other words, they increase mobility or motion by the increase of weight. The mallet that will overcome this moving force will produce

greater solidity at the point of impact. The reviewer demonstrated this thirty years ago. (*Dental Times*.)

The author's description of the amount of arsenic to be used to devitalize a pulp is not correct, and it is also not a scientific way of stating it: "A minute quantity, one-half or even one-fourth the size of the head of an ordinary pin, . . . will be found ample for its destruction." This is certainly very much more arsenic than necessary for the devitalization of a single pulp.

The advice given to "wait a week or ten days before removing the pulp" is bad. It requires about that period for decomposition to take place, and then pericemental inflammation is almost a certain result.

In the treatment of fistulæ the author adopts a curious method: "The root-canal should be filled and the external fistula packed with cotton to enlarge it. The cotton should be changed every twenty-four hours for a larger piece till the fistula is sufficiently expanded to permit of perfect access to the end of the root. When this is attained, a sharp bur in the engine should be used to ream out the carious bone and smooth the rough end of the root." The operation is a good one so far as the removing necrosed tissue is concerned, but why delay matters with cotton pressure when the knife or properly prepared instruments could more readily and immediately remove the intervening tissue?

The author, following Black's dictum, that metal can be used at any age, says, "It is not a question of age at all. It is a question of temperament; a question of physical and mental stamina on the part of the patient." This is a very remarkable statement, coming from the source it does, and is unworthy the author's recognized intelligence.

It is not pleasant to be forced to select here and there a statement which seems to controvert accepted methods or recognized facts, but this is not an ordinary book. Operative dentistry lies at the very foundation of all dentistry, and the author and critic must draw closely to the line of accepted practice. A book of this character is supposed to teach the rising dental generation how to treat teeth, and especially how to fill cavities caused by inroads of caries. It should, therefore, be entirely practical, and must be judged from that stand-point and that alone.

Readers of this book must admire the spirit of the author, manifested in every line, that of an unselfish devotion to the highest

ideals. It is not his fault if he fails to inspire a similar feeling in those who follow him. In the sense of an inspiration to good work the book can be cordially recommended, but it is hoped, if it reaches a second edition, that the author will be able to take a broader view of operative dentistry than he seems capable of doing at present.

The work is very satisfactory in its typographical make-up and in its illustrations, a very usual feature of all the publications of the S. S. White Dental Manufacturing Company.

Obituary.

W. GEORGE BEERS, L.D.S., D.D.S.

DIED December 26, 1900, Dr. W. George Beers, of Montreal, Canada.

Death has claimed many of the active workers in the dental profession during the past few years, but of these Dr. Beers will not be counted among the least. His ability, activity, and untiring devotion to his profession made his name prominent in Canada and throughout the United States.

He has been connected with the periodical literature of dentistry for many years, and his pungent editorials, well directed against violators of professional ethics, were eagerly read by his colleagues in all sections and extensively quoted. His work, however, was not confined to the *Dominion Dental Journal*, of which he was the principal editor at the time of his death, but extended to an active participation in the general literature of his profession. He was also a contributor to the leading magazines,—*Scribner*, *Century*, etc. This literary taste was manifested when quite young, having contributed in 1862-63 articles to Wilkes's *Spirit of the Times* on Canadian sports.

Dr. Beers was born in Montreal, May 5, 1843. He was educated at the Lower Canada College and at Phillips School, in that city, and subsequently entered the dental profession. He was the founder of the first dental journal in Canada. He occupied for eleven years the position of Secretary of the Dental Board of

Examiners for the Province of Quebec, and at one time filled the position of Dean of the Provincial Dental College.

It is due mainly to his efforts that dentistry in Canada has assumed its present advanced standard. He was fortunate in having for his colleagues men in thorough sympathy with him in his efforts to elevate dentistry, with the result that the profession there has not only earned the respect of its colaborers elsewhere, but has furnished a standard worthy of emulation.

There is a small class found in all callings who are born leaders, not from selfish motives, but that the work of their choice may advance through their efforts. It always seemed to the writer that Dr. Beers was pre-eminently a leader of this character, strong in his convictions, at times dealing sledge-hammer blows, but always with the one idea that dentistry might be made worthy the respect of men. He sacrificed himself in time, money, and strength to accomplish this, and doubtless died, as such men always die, with little to show in earthly riches.

The writer's personal acquaintance with Dr. Beers dates back many years. His last letter, received some two months since, expressed the same untiring desire for extended work. He thought the time had come when dental periodical literature should take another change, and that from monthly to weekly issues. He had great faith in the success of such a venture. The writer, while failing to agree with him as to the wisdom of such a move, could not help a degree of admiration for his faith in his professional colleagues.

It is presumed the fact is not generally known among Dr. Beers's friends outside of Canada, that he was a devoted athlete. He reduced the game of Lacrosse to a system, and through his efforts it was made a national game in Canada. He organized the first Canadian Lacrosse team to visit England. This was in 1876, commencing to play in Belfast, and from there in the principal towns of Ireland, Scotland, and England. At the command of the Queen, a game was played before her at Windsor Castle. He repeated this visit to England in 1883, and for the same purpose.

He was also active in local military circles, being captain of a company in the Victoria Volunteer Rifles.

His patriotism was of the vigorous sort, and he did not hesitate to give his opinion of those he regarded as violating international comity. At Syracuse, N. Y., in October, 1888, in a public address,

he severely castigated the United States for what he considered serious derelictions of duty. This received wide notice and comment.

His patriotism could at times present itself in a more sentimental form. It is related of him that when the Princess Louise and the Marquis of Lorne visited Montreal in 1878, they passed under an arch erected in front of Dr. Beers's house. As the carriage passed under the arch, Dr. Beers pulled a string attached to a basket of flowers, showering the royal couple.

Every good man in all ranks is sadly missed when the veil is drawn down on his life, but few, it is thought, will have passed beyond the borderland more sincerely mourned than the subject of this sketch. He will be sadly missed in this transition period of dentistry, for strong men are needed to carry the profession safely forward into the twentieth century, men who cannot be bought or influenced, but whose aim is always for the highest. Of such was W. George Beers.

His funeral took place at Montreal, December 28, and was largely attended by the various associations with which he was connected.

ACADEMY OF STOMATOLOGY—RESOLUTIONS OF RESPECT TO HENRY H. BURCHARD, M.D., D.D.S.

At the regular meeting of the Academy of Stomatology, held Tuesday evening, October 23, 1900, the Committee on Resolutions upon the death of Dr. Henry H. Burchard submitted the following, which were accepted and adopted:

WHEREAS, Henry H. Burchard, M.D., D.D.S., has been removed by death from the scene of his toils and his honors; therefore be it

Resolved, As the sense of this society, that in the death of Dr. Burchard the Academy of Stomatology has lost one of its most brilliant and useful members and the dental profession one of its most earnest workers.

As one of its organizers he was foremost in the endeavor to establish the Academy of Stomatology upon a plane of high professional usefulness, and was ever active in advancing its interest by contributing his own work and enlisting the co-operation of others. He gave unselfishly of his energies and best endeavors even when physically unfitted for the task. His active brain not only stimulated thought and discussion at the sessions of the Academy, but his suggestive help in the ordering of its affairs was always a material aid in its progress.

He was earnest and enthusiastic in his efforts to impart his knowledge to others. As a teacher he was clear, logical, and forcible. These qualities he evinced both as a writer and as a speaker.

As a man Dr. Burchard was genial and affable in disposition, ever ready to sacrifice his own time and strength whenever it was within his power to aid others, and especially those who were earnestly working in the field of dental advancement. In his brief and brilliant career as writer and teacher he had attained remarkable distinction, and though his untimely decease has occurred at an age when the promise of still greater achievements seemed clearly before him, he nevertheless attained an eminence in his profession as teacher, writer, and investigator seldom reached by others, and less frequently by those of his short period of life.

Resolved, That these resolutions be spread upon the minutes of the Academy, and that a copy be transmitted to his family and be published in the dental journals.

EDWIN T. DARBY,

S. H. GUILFORD,

EDWARD C. KIRK,

Committee.

ARCHIBALD C. EGLIN,

Secretary.

Notes and Comments.¹

ARE THE COLLEGES RESPONSIBLE FOR THE QUACKS?—We recall Dr. Barrett expressing himself on this subject as follows: "It is not too much to say that our professional reputation must be what our colleges make it. We are the educators of those who are to be the leaders in the future. The next generation of dentists will be what we shall make it. Legislatures may pass laws to regulate and restrict dental practice, but the stream can rise no higher than the fountain-head, and the practitioner of to-morrow must get his training and derive his professional knowledge from the schools of to-day. The colleges are the fountain-head, and the stream will be limpid or foul according to whether we purify or contaminate it."

This is true in a measure, but not in the breadth of the asser-

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

tion. The colleges, of course, should have the right moral stamina in them, or they should not exist. And teachers should endeavor to be an inspiration to their students, but it is too much to say that the college is responsible for the conduct of men after they leave her doors. If out of a class of one hundred students, five or even ten should go wrong in practice, and if Dr. Barrett is right, should the same school, the same teachers, the same influences, produce the ninety good men? This calls to mind an experience which occurred some years ago. After speaking to a class of students upon ethical matters, several members were expressing their views, when one man remarked that, notwithstanding all that had been said by his teachers, he and his chum intended to conduct an advertising establishment after they graduated, as they "intended to practise dentistry to make money." These men passed excellent examinations, and therefore graduated. They are to-day conducting an advertising practice. *Is their alma mater responsible for it?* It is not from a lack of teaching or example,—these are evident in every reputable college,—but in spite of them, that many of our men go wrong. The charlatan, we believe, is as surely a self-made man as many a reputable practitioner. Every one has it within himself to choose whether he is to rank with the blatant quack or whether he is to be respected. In the legal profession they have a way of keeping the would-be quack in line, by disbarring a man for unprofessional conduct. The bar associations are ever active in their efforts to purge their profession of dishonest and unworthy members. We suffer from the lack of some such means to turn out and shut out men who degrade an honorable calling.

INSTRUCTION OF MEDICAL STUDENTS IN THE PRINCIPLES OF DENTISTRY.—In a paper read before the American Medical Association, and published in the *Dental Cosmos*, Dr. M. L. Rhein says that the question narrows itself down to the advisability of the medical undergraduate being acquainted with principles of dentistry as they bear on general medicine. The general practitioner should appreciate fully the process of dentition in its relation both to local and constitutional results. Equally as important is it that he should be able to distinguish an incipient alveolar abscess from *tic douloureux*, simple caries from caries complicated by exposure of the pulp, or the inflammation attending the erup-

tion of a third molar from that caused by follicular tonsillitis. He should be taught to know that more teeth are lost through disease of the peridental membrane than through all other pathological conditions of the mouth combined, and that prophylactic measures tending to preserve this membrane are of vital importance. He should be made cognizant of the intimate relationship existing between the general nutrition and proper mastication, so as to realize when artificial teeth are required, and, if supplied, whether they are properly inserted. Such knowledge implies a proper understanding of the normal occlusion of the upper and lower teeth; it also leads to the appreciation of the value of orthodontia as a corrective for malocclusion.

A proper appreciation of the foregoing facts necessitates that medical undergraduates be taught dental embryology, anatomy, histology, and pathology, in order that these principles should form a foundation for a correct clinical observation of oral conditions. This will enable the general practitioner to serve best both his own interests and the interests of his patients, and at the same time tend to elevate the standing of the dental specialty.

Current News.

NEW YORK ODONTOLOGICAL SOCIETY.

At the annual meeting of the above Society the following officers were elected for the year 1901: President, Dr. W. W. Walker; Vice-President, Dr. J. F. P. Hodson; Recording Secretary, Dr. John I. Hart; Treasurer, Dr. F. C. Walker; Curator, Dr. J. Adams Bishop; Editor, Dr. J. W. Turner; Corresponding Secretary, Dr. W. D. Tracy.

RHODE ISLAND DENTAL SOCIETY—RESOLUTION.

Resolved, That the Rhode Island Dental Society heartily endorse the work that has been done by Dr. J. N. Crouse as Chairman of the Dental Protective Association, and that we earnestly urge him to continue that good work, which we realize has been accomplished at a personal sacrifice of time and money.

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Original Communications.¹

A CASE OF ORTHODONTIA DIAGNOSED AND PROGRESS WATCHED BY THE X-RAY.²

BY W. E. DECKER, D.D.S., BOSTON, MASS.

MR. PRESIDENT AND GENTLEMEN,—I appreciate very much the honor of appearing before the American Academy of Dental Science, and I trust I may be able to interest you for a few moments.

Many of the details of this case of regulating are not of particular interest. The all-important point is set forth in the subject of the paper,—“A Case of Orthodontia diagnosed and Progress watched by the X-Ray.”

As Dr. Angle said at Providence, a short time ago, “Many of our cases fail, or are more difficult, because of a lack of a complete and correct diagnosis.” We often study them in a short-sighted way, and endeavor to correct only the most conspicuous wrong, and, of course, fail to establish a correct occlusion and harmony between the arches and in the facial lines.

“The truth, the whole truth, and nothing but the truth” is

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the American Academy of Dental Science, December 5, 1900.

absolutely necessary for an intelligent and complete treatment. Previous to the introduction of the X-ray in dentistry the "whole truth" was sometimes impossible. But now with the skiagraph (and I hope some day with our own eyes) we are able to come very near it.

The patient was a girl fourteen years old. (Fig. 1.) The irregularity of the teeth was so great as to cause a marked deformity in the face. At first thought it would be pronounced a case of orthognothism, which, however, is only seeming. The slight protrusion of the chin is aggravated by a lack of development in the superior maxilla. A straight line touching the frontal and mental prominences shows the nose and upper lip to be much too far back. Upon looking at the bite the cause is obvious. (Fig. 2.) Two teeth are wanting in the superior arch. There is no sign of the left cuspid, the lateral standing in contact with the first bicuspid. On the right side the cuspid stands out on the labial gum some distance above its proper position, and the lateral and bicuspid are nearly in contact. Note the absence of any prominence on the gum to suggest an impacted cuspid. As you see by the models, our landmarks, the first molars occlude almost correctly. On the left side the superior first molar occludes about one-third of a tooth distally. On the right side the occlusion of the first molars, mesodistally, is almost correct. Please note the thinness of the plate over the anterior teeth.

The cause of the deformity seems to be an inherited tendency. It is a prominent characteristic of the family through several generations. Out of thirty-five persons in the last four generations, twenty-three are afflicted and only twelve have escaped, and even in these the suggestion is evident. Fig. 3 is a model of another member of the family. It is not only an unsightly deformity, but also a severe detriment to health. The incisors of the upper arch pass far below those of the lower arch and stand three-eighths of an inch inside the proper line of occlusion. Only five teeth meet for the mastication of food. Probably this would have been the fate of our patient had not orthodontia come to her rescue.

(Fig. 4.) When the patient first presented for consideration, it was thought by the family and myself that the superior left cuspid had been extracted. Other dentists, also, were of the same opinion, arguing that the arch had fallen, the lateral hurriedly

FIG. 1.

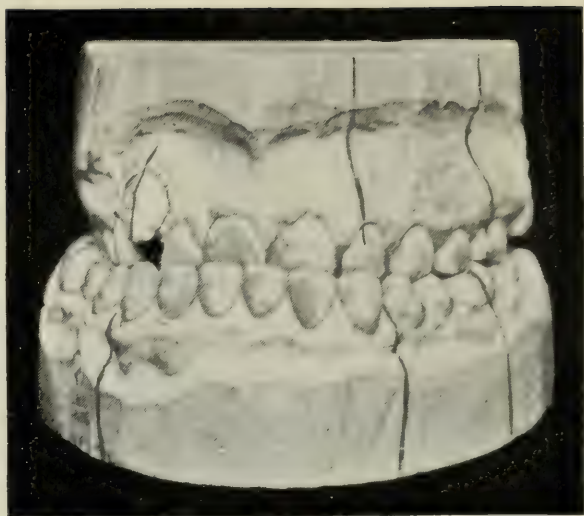
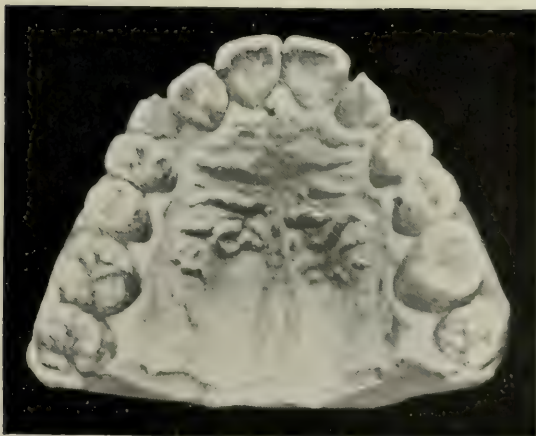


FIG. 3.



FIG. 4.



tipping into the cavity left by the extraction. There was no prominence on the roof of the mouth to show the presence of the tooth.

To improve the condition of the case without another tooth, either natural or false, was quite impossible. Therefore it was highly necessary to have positive proof of the absence or presence of the cuspid. The X-Ray quickly clears up these hidden mysteries. (Fig. 5.) And, as we see by the skiagraph, the cuspid lay deeply hidden in the bone. Its exact position is thus clearly shown. It stood at an angle of about forty-five degrees. The cusp was behind the lateral, about half-way up on the root. The apex of the root was about an eighth of an inch directly above the second bicuspid. The skiagraph told us that it was palatal to the lateral, as the outline of the cusp is slightly clearer than that of the lateral root at the point of lapping, showing that the cuspid was nearer the film.

We took several pictures,—one with the tube farther in front of the patient, another with the tube farther back, while this one was taken directly in front of the angle of the jaw. By comparing the negatives, we further learned that the cuspid was not rotated in its pocket but lay with its labial side out. Now, you see, we had that part of the case completely and correctly diagnosed, and what would probably have always remained a mystery is thus by the aid of the X-ray fully comprehended.

As I have said before, our first molars were in about correct occlusion, so the case did not call for the retraction of the chin, although a slight movement in this direction might have been beneficial. The course of treatment was now to expand the arch somewhat, slightly rotate the left first bicuspid, protrude the left lateral and central the width of a cuspid and the right central and lateral half that width, to elongate and press into line the right cuspid, and to erupt and bring into line the embedded left cuspid, and this is how I proceeded:

I banded the first molars with adjustable clamp bands and slipped into the tubes the expansion arch under tension. Then I ligated all of the teeth to the arch in a certain rotation. First the arch was pressed up and the right cuspid ligated to elongate. Then the four bicuspid were wired to expand and the incisors to protrude. While the tension of the wire arch was elongating the cuspid and expanding the arch, the protrusion was accomplished by constantly tightening the nuts on each side, the left considerably

more than the right. I did not attempt to make any speed with the case. In fact, the alveolar plate over the anterior teeth was so thin that I was compelled to go slowly in order to give nature time to build new bone. For a short time I had a band on the first bicuspid, with a small ring on the labial surface. Between this ring and the lateral I placed a small jack-screw, which rotated the bicuspid and at the same time helped to hurry forward the left incisors.

In five weeks I had the desired space, as this model shows. (Fig. 6.) Please again note the exceedingly thin anterior alveolar plate. For this radical change I was severely criticised, some contending that the teeth protruded in an unsightly manner. And so they did, but nature and our fulcrum retainer would not leave them so. Our active labors were finished for a time. What we had done was to help or encourage nature, and the retainer was so constructed that a constant improvement would gradually go on. It was practically a lever of the first class, the lips being the power, the wire to which the teeth were attached the fulcrum, and the process the weight. The manner of the attachment was the secret of the success. The right first molar was banded with a tube on the buccal surface, as was also the left first bicuspid that had been rotated. Upon the four centrals, high up at the gum-line, were cemented gold bands, on the labial surfaces of which were small tubes that had previously been split open. A wire arch was then placed in all these tubes. As it entered those on the side teeth it fell into the open ones on the anterior teeth; then they were pinched shut around the wire, leaving the teeth to swing freely on this as the fulcrum. I wish to here point out the great advantage of this over any rigid attachment. If all the bands had been soldered together, or all soldered to the wire arch, the teeth would have had to remain as they were, which would have left the case in a bad predicament, as the protrusion was so conspicuous. As it was, however, the teeth could move freely on the wire, as a fulcrum, and the lip was the power that in a few months brought about a wonderful and gratifying change. Its pressure tipped the roots forward, the process gradually filling out at the base of the nose to a remarkable extent, giving a vast improvement to the profile. The other teeth were attached to the arch by wire ligatures for a time, and a false cuspid fastened to the arch in the new space. Broken bits of the retainer can be seen on the model.

FIG. 5.

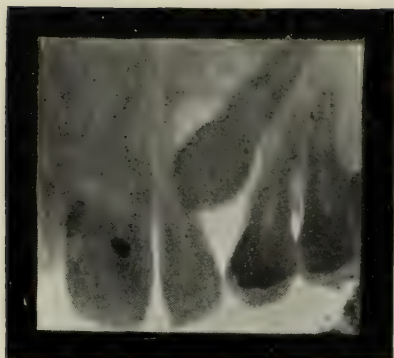


FIG. 6.



FIG. 7.

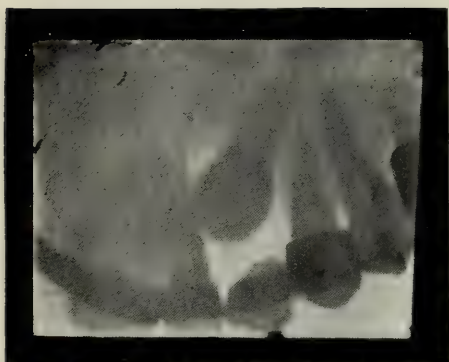


FIG. 8a.

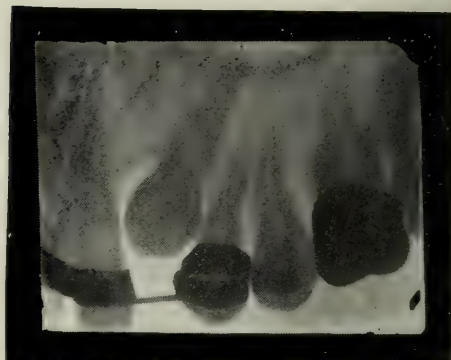


FIG. 8b.

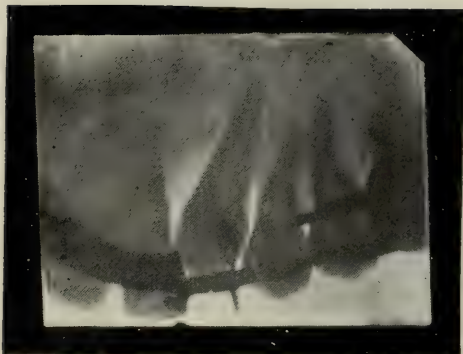
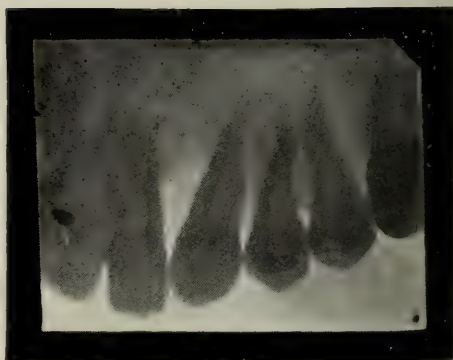


FIG. 9.



The skiagraph (Fig. 7) taken at this time shows the cuspid unlocked from behind the lateral root and standing directly above interposed false tooth.

Here we rested for one year. During the interval I saw the patient but twice. The cuspid had not made its appearance, and we concluded to forcibly erupt it. A skiagraph (Fig. 8a) showed that it had started but very little, and might have erupted in a few years. However, it would be impracticable to hold the space that long. During the year I lost some of the space,—not as much as appears in the negative, however, as this was not taken directly in front, and the shadow of the bicuspid extends into the opening.

Knowing exactly where to find the tooth, after an injection of eucaine I lanced the gum and chipped away a thin layer of process, finding a beautiful, well-developed tooth. I then drilled a small pit into the centre of it at the gingival border, threaded the cavity with a How tap, and screwed in a small post. (Fig. 8b.) The expansion arch was replaced and a wire ligature carried from the post down about the arch. By constantly twisting the wire, which put the arch under tension, the elongation went on rapidly. In the negative the post, arch, and twisted wire can be plainly seen. I also had a small hook thrown behind the lateral, and by screwing a nut on the arch straightened that tooth somewhat. In twenty-one days the tooth was brought down to its proper position, except that it was a little palatal to the correct occlusion. A longer-threaded post in the tooth, with a large flat nut that screwed against the outside of the arch, soon brought it labially as far as desired. (Fig. 9.)

As an acquaintance of mine often says, he would rather regulate fourteen times than retain a case. So I began to think before I found a retainer that would successfully hold the tooth in the arch. Of course, it was very loose and seemed to be hung on elastics, and would jump back the moment it was released. I made several retainers before I succeeded. The final one (Fig. 10) was a gold band around the cuspid, wide on the palatal side but narrow and under the gum on the labial surface, soldered to an adjustable band on the bicuspid, both being cemented on. To hold the expanded arch I constructed one of Dr. Baker's plates, with the small wires touching each tooth. These, resting against the incisors well up at the gingival border, acted as fulcrums, and the lips are constantly improving the position of the teeth.

The difference in the bite before and after the treatment is conspicuous. (Compare Figs. 2 and 11.) The one shows quite a normal occlusion,—at least a harmony between the arches. The impression for this model was taken recently, only four months after the completion of the work. The patient is still wearing the retainers. In a year or two from now I expect to find the position of the centrals still better and the depression at the base of the nose entirely gone.

The inside of the arch, also, shows a marked change. (Compare Figs. 4 and 12.) It is larger in every way. All of the teeth are in their places, the general contour is graceful, and the usefulness of the arch is established. In all probability the nasal fossæ are enlarged, and the patient is less liable to have adenoids, catarrh, and other nasal difficulties.

The profile is also improved. (Compare Figs. 1 and 13.) The chin does not seem to be so prominent. The face is more balanced, and will continue to improve instead of becoming worse as she grows older, as it surely would have done without any interference.

I am greatly indebted to Dr. D. M. Clapp for the X-ray work. The films are all very good, showing much more detail than can be reproduced in a cut.

ORIGINAL INVESTIGATION NOT A NECESSARY QUALITY OF THE TEACHER.

BY DR. C. M. WRIGHT, D.D.S., CINCINNATI, OHIO.

THE president of a great university has given expression to the opinion that university professors should be original investigators. This might be taken as a general proposition, embracing professors of the various branches of science, like chemistry, biology, physics, and psychology, and refer to special laboratory experiments; and it might include the more literary branches like philology, history, and political economy, and refer to studies of an original character. In each case the idea expresses the desirability of a special distinction or reputation for the study of some small part of science and the adding of some small fragment of fact to the general fund of human knowledge. The translation of some work from an ancient or modern language, the digging out of some obscure hieroglyphic,

FIG. 10.

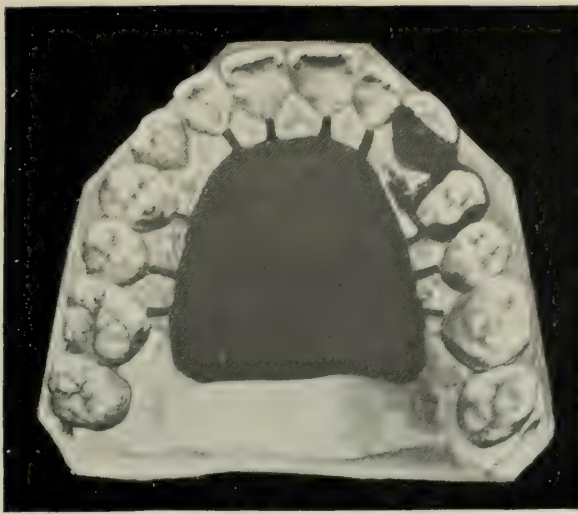
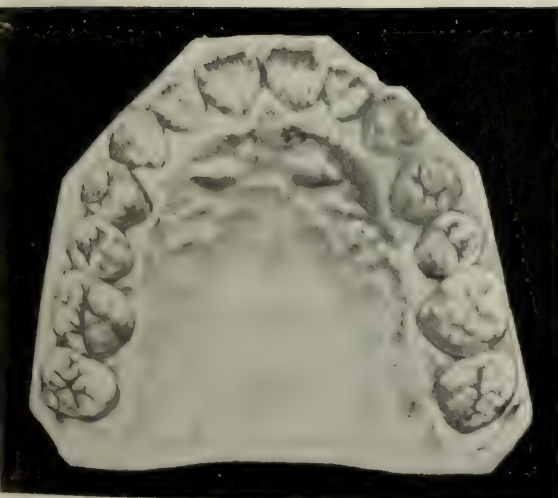


FIG. 11.



FIG. 12.

FIG. 13



the announcement of some startling doctrine in history or art or politics, or perhaps the editing of a text-book, might be considered an equivalent; but some of these special and distinctive things the professor must do to satisfy the demand of this university president.

A few years ago, in an address on the occasion of the opening of a new building for the Ohio College of Dental Surgery, I expressed thoughts differing entirely from the above notion. Subsequent thinking on the subject has not changed my opinion. I then claimed that the teacher need not be an "investigator," a writer, nor a great artist. I claimed that he should be, in the highest sense, simply a *teacher*. He occupies the place of middleman, between the investigator, the fact-hunter, the learned and patient gatherer of accepted facts and fancies in the various fields of knowledge, on the one hand, and the *student* or pupil on the other. He searches through the goods of the manufacturer and collector, selects what he deems good and proper for his customer, the student, and then exhibits them in his best style or art, the most necessary quality of which is his method of presenting and displaying the goods.

Teaching is a special art, a most important one. It is an art which has occupied the deepest thought of profound philosophers from remote times,—witness Descarte and the "Venerable" Bede. I am almost tempted to call it the art of arts, for it stands between the world, nature—all things seen and unseen—and the mind of man. It is only by the skill of the teacher that facts or doctrines can be digested and prepared for reception and assimilation by the student. In great universities, like some of those in the capitals of Europe and America, the original investigator should have his place and his title of professor, but he should be on furlough most of the time. The university furnishes the air suitable for his health, and his connection and association add an element to this same air which makes it favorable to students and the teaching corps. There are reflex benefits easily traced. From the advertising or business stand-point the work of these scientist-professors is also profitable, for they win distinction and fame for the university and draw students to its halls. Now, the teacher or the teaching professor plays a different *rôle*. He culls the flowers from the investigator's conservatory, arranges them into bouquets, groups them into arches and wreaths, and presents them to the developing

minds of the students; and they, according to their own and the teacher's ability, and according to the art of the teacher, gradually grasp the meaning and the beauty of the flowers and their places in the harmony of the knowledge which is power.

A teacher may be a special investigator, and an investigator may be a teacher, but my point is that they are distinct organs in the body, with different functions, and yet with an interdependence similar to that existing among different tissues of an organism. The teacher need not devote days and weeks in his laboratory, with reagents, microtomes, and microscopes, studying, let us say, for example, a villus in the alimentary canal. He needs only to be awake to grasp the fact that the epithelia of the villus may be possessed of a peculiar nucleus, or that the lining tissue of the radicle is suggestive of some peculiar function, which facts may have taken months of investigation, after years of special training on the part of the scientist. And then the teacher must be able to emphasize points, attract attention, elaborate, simplify, illustrate, and become enthusiastic over the fact, so that a hundred students may have this little seed sunk into their cortices, that it may spring up later into knowledge.

I once knew a Yankee tutor who came out West and established a classical and scientific school for boys. The scholars of the city sneered at the pretensions and attainments of the young man. "He has no diploma or degree. He was only an under-tutor in a Massachusetts academy. He is a charlatan in education, and cannot succeed." The young man used to reply good-humoredly, "I am a teacher. I have taught school since I was fifteen years of age."

I attended a banquet, the other day, of the alumni of the "Academy" established by this teacher,—the tenth annual banquet since his death and the closing of the academy,—and there met some of the most learned professional men, prominent politicians, business men, and distinguished teachers of the city; and in the post-prandial addresses it was noticeable that supreme credit was accorded the dead man as "the successful teacher." My own experience with and reflections about the methods of this teacher placed me in accord with the universal opinion, for algebra, geometry, physical geography, and other branches taught by him were so illuminated in their presentation by the genius of the man that they have ever remained as clearly defined stepping-stones in my

own pathway of development; and yet this man was in no sense a mathematician or a geographer.

Another example: A German applied for the position of teacher of English in a Swiss city school. "You are not an Englishman; how can you teach English?" asked the board. "You did not ask for an Englishman, but a teacher of English, and I am a *teacher*." He emphasized the "*teacher*." He received the appointment, and proved by years of service and satisfaction that he had the correct idea.

One more picture. One of the most distinguished scientists of Cincinnati, a chemist, an astronomer, a mathematician,—referred to, by the way, in Professor Lloyd's "*Etidorpha*,"—was professor of chemistry in medical and dental schools of this city many years ago. He was appointed on account of his distinction in knowledge and world-wide scientific reputation, yet, with the deepest reverence for his work, reputation, and personality, I think I can honestly say that his students in the aforesaid colleges did not grasp, in the least, the subjects he tried to teach. He could not adapt himself to the plane of understanding of the ordinary student. He was not a teacher. This man was an honor to any institution with which he might be connected—but he should have been kept in his laboratory at the expense of the school.

Some of the great ones in the art of dentistry, whose works are masterpieces in operative or prosthetic dentistry, cannot teach.

Great lecturers, writers, and critics on art, whose words become inspirations and axioms on perspective, or color, or metre, may not be able to draw or paint, or strike a note. They are teachers. The art of teaching is different from the art of investigating or doing.

AN ARGUMENT FOR MEDICAL EDUCATION OF DENTISTS.

BY EUGENE S. TALBOT, M.D., D.D.S.

A TWENTY-SEVEN-YEAR-OLD woman came to me in November, 1900, through her physician, for advice and treatment. She is a proof-reader for a magazine. She weighs ninety-four pounds, and her assimilation is poor. She has cold hands and feet, and is

awakened about three A.M. with cold extremities and cannot get to sleep except by wrapping her legs and feet in a woollen blanket. A year ago peritonitis from exposure to cold and coincident low vitality resulted, from which she recovered. Her mouth and teeth were so sensitive that eating was a torture. On application to a dentist, he, finding the teeth sensitive, applied arsenic and destroyed three pulps in small superficial cavities. The treatment did not seem logical to the woman, since every other cavity was as sensitive. The teeth in which the pulps had been removed were very sore. Upon tapping, the sound teeth were found equally painful with those whose pulps had been removed.

Interstitial gingivitis of a low type extended throughout the entire alveolar processes. The woman was placed upon tonics. The gums and alveolar process were treated with iodine. Her vitality is gradually being restored. The interstitial gingivitis is lessening and the teeth are recovering their normal condition.

Operations for filling, previously impossible, are now producing excellent results.

THE DUTY OF YOUNG MEN TO THE PROFESSION.¹

BY GUY R. DANFORTH, D.D.S.

THE subject I have chosen for a brief summary this afternoon may appear to some of you as being familiar. I will admit that the subject, as well as some parts of the subject-matter, was taken from a well-known work,—viz., “The Practice Builder,” by Dr. C. R. Hambly.

The late Collis P. Huntington said, in his advice to young men, “No one can follow in the footsteps of another. He must work out his own destiny.” This, I think, holds good in the dental profession as well as in any other calling in life. A young man beginning the practice of dentistry has, or, if not, he should have, an ideal, a worthy example of success, some man who by a noble character and by conscientious and devoted attention to his profession

¹ Read at the sixth annual meeting of the Jefferson County Dental Society, Watertown, N. Y.

has attained a high standard of proficiency. He should consider at the start that "anything worth doing is worth doing well."

A young man may work his way through a dental college, pass the scheduled examinations of the course, and manage to squeeze through the final tests. He goes into active practice, either for himself or with some older practitioner, without even daring to try the examination required by the State in which he is practising. Does this man do his duty? Is he honest in the first steps of his professional career? A young man's duty to self is an all-important factor in reckoning his future success. He should, to the best of his ability, become familiar with theoretical dentistry before leaving college, and then, by close application, study, and careful practice of theory, become a thorough master of practical dentistry.

After the performance of duty to one's self in the line of professional education and qualifications follows a very important duty,—that of a young practitioner to his patient. An operation about the mouth, no matter how trivial it may seem, must be performed with extreme care and under the most strict aseptic conditions. It does not take years of experience to find that the least neglect or carelessness on your part in the treatment or filling of a tooth may, and almost invariably does, result in disaster. The best is none too good, and in some cases an operation performed with the greatest thoroughness will result in failure. Thus we see that under no circumstances whatever must a young practitioner neglect, to even the slightest degree, his part in the preservation of a tooth to which his professional attention has been called.

Every one is liable to mistake, but when one's services are needed it is his duty to do the very best in his judgment in the particular case brought to his attention. The greatest success is achieved by the man who strives to do the very best work that can be done, no matter how long it takes him or how little his recompense may be.

A young dentist is apt to have a large variety of patients. The "shoppers" always give him a call. The "dissatisfied" call to have him examine the plate they are wearing or some filling they have had done,—“to get your opinion,” they say. The best reply to such might be, “that you are not in the habit of passing criticism on other people's work.” There are also charity patients, which if worthy should receive attention. But the most desirable

and certainly the best patients are his friends who are anxious for his success. The others should be treated with due respect, but not catered to.

The main object of a young man in beginning the practice of his profession is to please. There are many ways in which to do this; in fact, as many ways as there are classes of people. But I presume to say that the quickest and surest way to please the largest number of people would be to put the price of gold crowns down to three dollars, plates to five dollars, and other work accordingly. I would feel better satisfied, I believe, to please a small number of people for a long period of time than to please a large number of people a short time.

It is the natural tendency of people to go where they can get the most for the least money. This is especially true in dentistry. But the question is, Do these people profit in the end?

Every one knows—if they do not, they should know—that the organs of mastication are as valuable to them as any part of their anatomy, and that the cost of their preservation should not be considered. It pays in the end to use the very best material that can be obtained, and take the greatest possible pains in every case, even if the recompense at that time is not as great as you would desire. The price should be such that you can afford to use the best material and spend any amount of time necessary for the completion of the work. “Economy is a good quality, but one may use too much of it and lose money.” “That economy which has for its purpose the very best materials that money can buy, without variation, irrespective of maker or seller, is the only economy that can be practised in dentistry. If the economy that is based upon liberal conceptions of your obligation to your patients is practised, it cannot but result to your profit. A young man who desires that his patrons should have confidence in him must have confidence in himself. He may be troubled with a lack of confidence or over-confidence, both of which are fatal. It is better to know that you do not know than to believe you know when you do not know.” (Hambly.)

Honesty is one of the first stepping-stones towards the attainment of success. It is claimed by many that “Dishonesty is the best business policy.” It cannot be denied but that some succeed in this way, but a solid and more permanent foundation can be built by strict honesty than by any amount of misrepresentation.

An all-important factor in the conduct of a young man is his respect for his brother dentist. It should be courteous, dignified, and gentlemanly. You are our fathers or our brothers. The very least that you can expect of us who are younger in years and experience is that we shall prove to every one of you that we are gentlemen. No dentist knows what moment he may have need for the friendship of another. At the very moment when he least expects it he may need evidence in a law-suit as to his ability.

“A young man should scrupulously and strenuously avoid the rôle of a cynic.”

A cynic, as you all know, is one who never sees a good quality in a brother of the same profession. “He is a human owl, vigilant in darkness, but blind to the light. He goes mousing for vermin and never seeks noble game. His criticisms fall indiscriminately upon the old and young like frost upon flowers. If a man is said to be noble and good, he will answer, ‘Yes, in the day-time.’ If his neighbor is having a good practice, he says, ‘Yes, people want their pay.’ If he joins the lodge or the church, he says, ‘Yes, to get practice.’ Such a man is generous, ‘Yes, with other people’s money.’ This man is very obliging, ‘Yes to lull suspicion and cheat you.’ Thus his eye strains out every good quality and takes in only the bad.” As I think of my fellow-man and my brother in the profession, I like to think that something has survived the fall, something of good lives in him. Man has been called “A desolate city, and his passions are like the wild beasts of the wilderness howling in kings’ palaces.” Yet, he is God’s workmanship, and a thousand touches of exquisite beauty yet remain. “A man will be what his most cherished feelings are.”

If he will encourage a noble generosity, a spirit of manliness and honor and true fraternity towards the profession, every feeling of his own soul will be enriched; but if he shall nurse bitter and envenomed thoughts, his own spirit will absorb the poison; he then will be the loser and he will crawl among men as a burnished adder whose life is mischief and whose errand is death.

“He who hunts for flowers will find flowers, and he who loves weeds will find weeds.” Honesty, manliness, temperance, integrity, industry, and economy are words every young man should seek to be familiar with, for in these words are whole volumes from which a young man may learn his duty to the profession.

PREDISPOSITION AND ENVIRONMENT: HOW CAN
THEY BE GOVERNED?

BY DR. G. ALDEN MILLS, NEW YORK.

ALL the secretions which come in contact with the outward atmosphere must be subjected to sanitary conditions, otherwise they will produce disordered surroundings; left entirely without care, diseases will result. The teeth and mouth prove marked examples in proportion to the abnormal state of the body, through which these secretions are generated and have their flow. Every mouth that is left without sanitary care under these conditions will at once begin to accumulate what is termed "sordes," or what may be better understood by a portion of the public, "filth;" as the English say, "nasty." Polite as we may be, we, as practitioners, see cases that the latter term fully expresses. One oft-repeated phrase has been voiced in dental gatherings: "Could the teeth be kept absolutely clean, decay would find no field for its ravages." Too often this expression would seem to carry the impression that we are helpless. Therefore the result has been a laxity in definite emphasis for extreme efforts. We hardly dare to give our estimate of the percentage of practitioners who teach to their patients line upon line the necessity of assiduous, painstaking care of the teeth, yet we will say that it is marvellously small. To-day we are deluged with a multiplicity of devices in brushes, soaps, and washes; and last of all we have lately seen advertised by the railway in big letters, "Use Sapolio on the teeth." There is no doubt that it would clean teeth, and might not be a bad article to commence with in some cases. Is it not a fact that the dentist too often stops with these helpful remedies and too much the public is misled into the belief that these articles do prevent decay to such an extent that deception follows? That brushes and etceteras do to a degree lessen the possibilities of decay is true. Too much the patient is met, in answer to his inquiries regarding the saving of his teeth, by the wise answer, Nothing but a "prophylactic" treatment will save your teeth. And many a one draws a quicker and deeper breath and wonders, perchance, how much this is a bottle. We are not overdrawing a common way of looking at this question.

Now, while prophylaxis is quite a big term, yet it has a meaning if carried out on the line of intelligence, and this must be

most largely by a practical demonstration on the patient. To get the needed results there must be an enlarged, systematic course of practice established, not by the few, but by the many. It is to the heart of our calling that this appeal must apply. I need not tell it here that there is a constantly increasing, retrograde nucleus fastening upon the legitimate calling of dentistry which has the commercial thought largely in view; therefore, there is a necessity for higher attainments on our side. We owe it to our clientele and ourselves to do all in our power to lessen the arduousness of labor. Prevention will prove a larger-meaning term than any other providing we do it with a will, endeavoring to prove its efficacy.

The remarks made by Dr. Jarvie, of Brooklyn, at a late meeting of the Odontological Society has inspired this paper to emphasize the subject, "Prevention of Caries." The doctor said a lady patient asked him why it would not be a good practical plan to have qualified persons come to our houses and clean teeth, as we have such persons come to cleanse and care for our nails? In connection with this there came another woman (dentist) the same day who had gone to the expense of legitimately preparing herself for the practice of dentistry. For ten months she had faithfully pursued the effort to gain a supporting clientele, until she was almost in despair at not having succeeded. This incident led him to propound the query whether it might not be a good idea to encourage the plan suggested by the lady. It was not surprising that it met with a chill, for, first, there would be a decided prejudice, and, as has been truly said, cleansing teeth is a big subject in its deepest application, as we have emphasized in the early part of this essay. This was suggested to Dr. Jarvie. I do think that good might come of the suggestion if but applied to the juvenile portion of the household, making it a part of the duty of nurses in the care of children, and I further think that the families of wealth and culture would welcome this kind of practice if endorsed by practitioners of good standing. Here is a suitably qualified person to inaugurate such a movement. For children to become habituated to the daily faithful care of the teeth would be a decided assistance to the dentist in the maturer care of the teeth, and in the line advocated there will be a growing appreciation of services rendered. Children who come into our hands, particularly the class we have been speaking of, treated by this prelimi-

nary training would become familiarized with a frequent manipulation, and this would render us valuable assistance in the more extended services required.

That this subject of systematic practice in the earlier care of teeth is to become a decidedly emphasized one I am sure is being outlined by a few sincere and earnest practitioners who are combining both the practical and the commercial, and by their proposition to their patients it presents a feature of novelty. It is evident that this will work favorably in more ways than are at first thought of. In the first place it will prove that dentistry may be made vastly more salvatory than ever before. It will lessen the labor of practice by making it quite unlikely and impossible for extreme operations to become necessary. It will do much to remove the dread of practice. Patients will become less resisting. There will be a large decrease in dental decay. The object of this course of practice is of a firm belief that teeth predisposed to caries will be the ones that we desire to improve. It stands to reason that the environment will be decidedly bettered. As it was once said by Dr. Foster Flagg, regarding his theory of the "new departure," "The teeth that most need saving will be the ones that will be saved." Familiarizing children with operative movements upon the mouth will attain results which can hardly be computed. These children will grow up into mature patients.

I have often asserted that a practitioner who would start out on these lines would never know a need for practice, and he will have a hold upon patients that will be difficult to break.

I have a student that spent four years in my office, during which period the effort was made to instil the convictions that the teachings on this line were sound; and he began to practise accordingly. It was a pleasure to notice the genial fellowship he had with his little patients. While his practice was conducted on lines of marked simplicity, yet the results were immensely practical. It is not claimed that our practice is wholly conducted on the systematic plan referred to, but the teachings and writings bear accord to the fact that there has been manifested a decided interest upon the subject throughout the entire practice, now nearing fifty years. In 1867 (I think), in the *Dental Register*, will be found an article on "Cleaning Teeth," that gave decided teaching regarding cleansing, and more particularly the value of polishing. Professor Cutler, at that date well known as a valued teacher,

emphasized this article to the students of the Ohio Dental College as the best he had ever seen on the subject. There is a little history connected with the publication of this article. It was first sent to the *Dental Cosmos*, and after it had lain in the editorial sanctum for some weeks, hearing nothing from it, I wrote to know what to expect. The manuscript was returned with a note, thinking it hardly worthy of a place in the journal. I felt quite a little cut. The paper was shown to several dentists and their opinion asked as to its worthiness, and all said publish it. In this article the history was given of the first attention to the value of polishing teeth which was given by my preceptor. He said to me, "Do you know how nice a polish a natural tooth will take?" So he suggested that I should see what I could do with a six-year molar, just extracted. I took it to the laboratory and put it into a lathe, and with pumice and powder produced a brilliant surface. This tooth was carried in the pocket for a number of years, and often was exhibited to practitioners. In this paper these facts were stated, and the practice was emphasized and illustrated from a case on which several hours were spent. It was a patient that had had heroic treatment with iron remedies, and the teeth had been decidedly etched. I was solicited to do all I could to give smooth surfaces. At that time I exhibited the specimen tooth. The result was very satisfactory, and a fee of over one hundred dollars was paid, which at that time was thought to be large. I could have earned more filling teeth in the time taken.

We notice that Drs. Smith and Taylor term their services "massaging the teeth." Besides the polishing and cleansing, they manipulate the surfaces of the teeth, and, we think, the gums, which, no doubt, is productive of good results. No doubt Dr. Smith secures results that are decidedly salvatory, particularly on young teeth. It is a great oversight that so many of our practitioners have so long resisted a larger attention to this kindergarten practice. I am sure that this is our first duty to young children.

Our full duty will not be done on this line when we say we turn this practice over to assistants, unless they have been intelligently instructed. I am not quite sure but it would be the best way to familiarize the first-year students with the teeth and mouth. By this they would become used to the work, which is a very important beginning.

Dr. Taylor, of Hartford, has instituted a very commendable movement in the New York Dental School. He has sought to introduce the special instruction of this line of teaching by giving his own time to it and by offering a prize to the student who will show the best results. He began it at the last term and gave a prize. The prize is of little consequence, but the practitioner who becomes imbued with the value of this practice has a rich future before him of appreciation from those who get the demonstration of a definite practice of a systematic cleansing and polishing of teeth.

Dr. Smith's promises carry a large inducement to his patients,—viz., an immunity from decay that brings a necessity for filling to the minimum. Now, it is certain that he could not sustain such a plan if he could not prove it. We understand he is giving full proof.

The dealings of this paper have been wholly along the line of a juvenile practice, but be it far from my belief but that a very large percentage of salvatory benefits will accrue to the adult practice. While not a few come to us when much mischief has matured for the want of this juvenile practice, yet it stands to reason that a frequent attention would decrease the advance of disorder culminating in a larger mischief. As dentists we are not too much given to the exhibition of simple demonstrations. Simplicity leads us away from multiplicity. It has been said by some that they do not have difficult operations, for they first reduce the difficulties to easiness of operation. This is true of filling teeth.

The method advocated by Dr. Smith, as he gives it in detail as practised first on his little grandchildren, seems at first too simple, but it is a work commenced upon very impressible material which establishes a willing habit. We all know more or less the force of habit, particularly of unprofitable ones. This method of dealing with children will rob dental practice of its greatest bugbear, dread and fear. It is sure to establish an environment of bettered conditions that will stand over against the disabilities of predisposition. So far prophylactic treatment has alone been employed, by resorting to principally chemical agencies. If we can secure a larger favorableness of environment we will do much to lessen the need of chemical agencies. There is a condition of the body that is constantly exposed to sudden and unexpected changes,

and we cannot eradicate them. There are many things that can be done which will lessen them. Our mental environment, our bodily environment, be they favorable or the opposite, will do much to help or hinder a favorable chemical equilibrium. These discords are the factors that operate so destructively by forming a union with atmospheric contact. We are brought face to face with the fact that there is nothing that can destroy the discord in physical conditions which give predisposition its lurking power of destruction. Now, most of all that we can do is to better the environment. While we seek to do this by working along prophylactic lines, it may be that there are some possibilities in constitutional treatment. There are those who are claiming that they do get better results. Dr. George Winkler is an ardent advocate of this practice. His writings are on record. Be this a remedial practice in any degree, it does not cover the ground nor interfere at all with the imperative needs of local treatment on the lines already referred to.

In connection with long familiarity with the treatment of the so-called "Riggs's Disease," I have often laid a good deal of stress upon the fact that the Riggs treatment meant also literally "cleaning teeth" from A to Z and from cutting edge to apex of root, if it so indicated a need. In many a severe case where this has been practised the results have revealed marvels of improvement, and in many cases, could the practice have been followed up, greater results would have accrued. In many cases that have come from places quite remote I have not had the opportunity to secure the best effects. The person has always been impressed with the importance of closely watching these cases. We have been told by practitioners who afterwards had the privilege of following up some of them, they did not have any encouragement because there was "no money in it;" "these people would go to New York and pay a big fee, but for them there were no funds left." Is not this a puerile excuse? Do these remarks justify the action? I think not. How were we able to get these "big fees"? When the results brought conviction I commenced to follow these by taking tuition, and putting into practice what I had learned. Is it to be supposed that one hundred dollars was received, more or less, for my *first* cases? No; all kinds of patients would let me practise on them to secure proficiency. This was twenty years ago.

In other lines of practice operators are supposed to get some-

what skilful in this length of time if ever. During this period I have had a variety of experiences that come more or less to those that enter new fields of practice. Scarcely any one was emphasizing Dr. Riggs's method of practice, as dealing systematically with the disorder so much talked of now.

Providentially, I believe, I was brought in personal contact with the late doctor, and during some thirteen months a continued observation of cases before and after deepened a decided conviction on my mind regarding the value of what was seen. In this connection all I saw and heard emphasized this initial practice of "cleaning teeth among the juvenile patients." Dr. Taylor at one time associated with Dr. Riggs and imbibed the virtue of such practice, and for the larger carrying out of what he learned and has in some small degree practised he sees a larger field for its usefulness; and becoming interested by observation at Dr. Smith's chair, he combines methods and goes out to teach them among those that are to make up to some extent the future profession. We trust many other dental institutions will hasten to follow the good example.

We have heard some little carping about the commercial spirit embraced in Dr. Smith's contract system. Such an objection is a puerile one. I find that patients that make contracts, and make even part payment, become more interested as participants in what is being done for them. This is a well-known fact and often commented upon concerning plate-work. It works admirably in the plan of putting the mouth in order and surgical treatment. It has a marked effect on both patient and operator to get the money question behind and out of the way, and there would be less loss of funds for faithful services rendered. It is a severe disappointment to lose compensation for hard-earned rewards, certainly when it is meanly imposed upon us. The late Dr. Atkinson had a bitter and depressing experience on this line. Over ninety-odd thousands of hard-earned dollars was a large amount to leave behind at one's demise. Predisposition to meanness inborn in many natures requires also a much-bettered environment.

This subject alone is worthy of attention as an advance in professional dealing.

Abstracts and Translations.

MEDICINE OF THE NINETEENTH CENTURY.

NOTWITHSTANDING the power that the discovery of the uses of steam and electricity has given to the race; notwithstanding the happiness that education and improved ethics have brought to humanity, the greatest gift that the nineteenth century has given to man has been the discovery of scientific laws that lead to health; laws by the knowledge of which the plague and the diseases of other countries have been kept from spreading through the community, and laws which have taught physicians how to speedily ease suffering and to save and lengthen life.

A masterly and comprehensive syndicate article on "Medicine in the Nineteenth Century," from the pen of Dr. Osler, has just appeared. In it he sums up the discoveries and the advances of medical science in the last one hundred years, and to the layman his lucid descriptions of progress cannot but be a revelation.

At the beginning of the last century the theory that "aqueous" and "dry humors" were the seat of disease was still taught. In 1801 Bichat, a young French physician, taught that the seat of disease was not in the organs themselves, but in the tissues of the organs, and thus gave an impulse to the study of morbid anatomy. Laennec discovered the art of auscultation, and his contributions to the study of the diseases of the lung and heart really laid the foundation of modern clinical medicine. Bright's researches on the kidneys and the differentiation of the fevers into typhoid, typhus, relapsing, and yellow were the beginning of the original work. Once the idea of scientific investigation took the place of the philosophic discussion of theories, the light began to break, and as it lit up one source of disease after another, we, who look backward in review, can see how dense must have been the darkness of ignorance before the present century.

In the growth of specialism, while there has, perhaps, been a loss in breadth and harmony, there has been the compensation of greater accuracy in the application of special knowledge. This has been particularly valuable in the diseases which are peculiar

to women, especially to accidents incident to child-bearing, and in the great improvement in the treatment of insanity.

At the beginning of the century there were but three medical colleges in the United States and only two general hospitals. It was the custom of practitioners to take students as apprentices, and the well-to-do finished their education abroad. After 1830 a remarkable change took place, owing to the leaven of French science brought from Paris by American students. Between 1840 and 1870 there was a great increase in the number of medical schools, but the standard was low and the work poor, from the multiplicity and rivalry of ill-equipped institutions. However, the evolution of the medical school that followed the reformation, begun in 1868, by raising the standard over the whole country, was one of the most remarkable phenomena in the history of medicine in the United States.

Dr. Osler calls attention to the fact that sanitary science, or hygiene, is one of the bright spots of the century. A knowledge of the conditions of disease, and the means of transmission together with the culmination of the art of preventive measures, has made small-pox, as a dangerous disease, a thing of the past. It has effectually kept cholera and the bubonic plague from spreading in the country. It has restricted yellow fever to its original localities, and has reduced the death-rate of typhus from twelve hundred and twenty-eight per million—in England sixty years ago—to three per million to-day, while it has so conclusively proved the exact precautions that must be observed to prevent typhoid and tuberculosis, that it is only through gross carelessness and wilful lack of sanitary measures that they can spread.

But as he remarks: "Preventive medicine was a blundering, incomplete science until bacteriology opened unheard-of possibilities for the prevention of disease." The brilliant overthrow of the hitherto much-discussed theory of "spontaneous generation," by Pasteur, Tyndall, Koch, and Cohn, and the tracing of each disease to its bacteriologic origin has been the bright triumph of the century. It has led to a knowledge of wound infection, which has served as the foundation stone of the science and art of modern surgery. It has been the means of determining definitely the cause of leprosy, so that plague may never again obtain a foothold. It has reduced the aggregate death-rate of diphtheria fully fifty per cent. since the discovery of antitoxin, and concerning that most

deadly and insidious of human diseases, which Dr. Oliver Wendell Holmes called the "white plague,"—tuberculosis,—it has taught the origin and means of prevention, that may, if faithfully followed, lead to the eradication of the disease. In summing up the revelations that have been made concerning contagious disease, through bacteriologic investigation, Dr. Osler outlines the fields of investigation that have not yet been worked with success. The cause of contagion of the exanthemata, measles, scarlet fever, chicken-pox, small-pox, and of whooping-cough, though yet unknown, he thinks may be of bacterial origin, but that the special bacteria may be too minute for any known microscope to reveal.

The last word of the century on these lines is concerning serum-therapy, which experimenters are trying for every contagious disease, with effects that will probably modify present lines of treatment within the next ten years. While there has been a remarkable diminution in the prevalence of a large number of all the acute infections, "pneumonia," says Dr. Osler, "not only holds its own, but seems to have increased in its virulence," while concerning venereal diseases, which continue to embarrass the social economist and to perplex and distress the profession, he recommends legislation.

The brilliant experiments of the summer of 1900 on the Roman Campagna, proving conclusively that malaria can be communicated by mosquitoes, and solving at once the mystery of marshy lands, the hot season, and the night air, is almost a spectacular ending to the century's work and opens an entirely new field for investigation concerning the relations of insects and animals to human diseases.

One of the striking features of modern medicine, as Dr. Osler points out, is the tendency on the part of physicians to give little or no medicine and to substitute attention to diet, exercise, rest, and climate for drugs. And yet the century never witnessed a more perfect and all-abiding faith in drugs on the part of the layman than at its close. But as this man of wisdom concludes, faith is as ever a large element in the success of the practitioner, and, as Galen said, "confidence and hope do more than physic."—*Editorial in The Journal of the American Medical Association.*

UNQUALIFIED DENTAL PRACTICE.

Two deaths from septicæmia following close upon one another emphasize the danger to which the public are exposed in the existing state of the law. One which occurred in Manchester is instructive in several respects. The patient, a healthy girl, died of rapid septicæmia after the extraction of a tooth, notwithstanding that every effort was made to save her by the medical man attending her, and by a surgeon called in in consultation. The operation was performed at the establishment carried on by the executors of the late Mr. Parkinson, by an unqualified practitioner. It has long been known that in their advertisements the words "Exors. of" were inconspicuous, while the name of Mr. Parkinson was in large type, and it was elicited in evidence that the words "qualified by examination" appeared upon the place. The operator said that these words did not apply to him, and the jury, in asking the coroner to censure the executors, said that they published themselves as fully qualified dentists when there was not one about the place. Thus the public are deliberately deceived, and this has been going on for years.

In the other case the patient, who was found on a post-mortem to have died of septic meningitis, had gone to a chemist in Rotherhithe to have a tooth extracted, which operation was done by an unqualified person, and, according to the evidence of the surgeon who made the post-mortem, unskilfully, unnecessary injury having been inflicted. There was not the smallest doubt that the infection was caused at the time of the operation, and it is noteworthy that the patient had observed to his wife that the instrument was so dirty that he had nearly told the man not to put such a dirty thing into his mouth. It was produced at the inquest, and one juror remarked that it was more fit for drawing a horse's tooth than a man's, and the coroner noticed that it was still discolored.

Meanwhile, no opportunity should be neglected of giving the utmost publicity to such disasters as may occur, and very much may be done in this direction by individuals. Every dentist should avail himself of the opportunities afforded in his daily practice of talking to his patients about such cases as these here recorded; consistent effort in such directions will do more to educate public opinion than any amount of writing in the press.—*Abstract Editorial, Journal of the British Dental Association.*

ACTINOMYCOSIS.

PORTER (*Boston Medical and Surgical Journal*, No. 11, 1900) states that the object of his paper is to attract attention to the possibility that a proportion of the cases ranking as alveolar abscesses may be due to this specific organism.

Though actinomycosis has been considered a relatively rare disease, he notes that it seems more probable that it is one which is very commonly overlooked. In its clinical aspects there is little that is characteristic. Though the course of the infection may make the surgeon suspicious, examination by microscope and culture is essential for a positive diagnosis.

The infection seems to enter most frequently near a carious tooth, or is carried in by a foreign body through the mucous membrane of the mouth or pharynx. Infection is rarely pure, but is usually mixed with ordinary pyogenic organisms or mouth bacteria. Clinically and under the microscope the disease is characterized by the formation of an unusual amount of dense connective tissue, which ends more or less abruptly at the periphery and infiltrates the adjacent muscle or fat. In the jaw the bone itself is rarely involved in human actinomycosis, though it may be thickened from periostitis.

Glandular enlargement is conspicuous by its absence, and when present seems to be due to mixed infection. Metastasis seems to occur through the blood-current and not by way of the lymphatics. In serious cases the disease may progress down the neck, into the antrum, or through the base of the skull.

Trismus, though often present, is no more characteristic of this disease than of other inflammatory affections, though if the masseter were involved in the dense connective tissue, the jaw would probably remain stiff for a long time.

It is rarely possible, the author states, to make a clinical diagnosis of actinomycosis; recurrent abscesses without necrosis, chronic, painless, subcutaneous abscesses about the jaw, evidently not connected with tubercular glands, would lead to a suspicion of this disease. If these fluctuating areas were surrounded by especially firm and hard connective tissue, and a sinus could be felt under the skin, if there were little œdema and swelling, perhaps a probable diagnosis could be made.

Examination of the discharge is of great assistance, but the

mere presence of the so-called sulphur granules is not conclusive, and no case should be considered as one of actinomycosis without competent microscopic examination.

In examining for actinomycosis, gauze sponges which absorb the discharge should not be used. All bleeding, when possible, should be stopped before opening the abscess wall. Unless badly contaminated, actinomycosis pus appears usually as a clear, perhaps blood-tinged, slightly syrupy sero-pus. Placed on a cover-glass the granules vary in size from a millet-seed to the head of a large pin. They are usually round with a clear-cut periphery; the color is gray or grayish yellow, often suggesting a small pearl. The centre is not rarely somewhat darker. Fluid should be examined at once, for these granules are found with great difficulty when the blood has clotted.

With reference to treatment, the author thinks that two facts speak strongly for the self-limitation of the disease in the majority of cases. Though it cannot be a rare affection, few cases enter the hospital with advanced actinomycosis of the jaw, and it seems therefore certain that many recover after a simple incision of the abscess, and even through a natural rupture of it.

It is surprising to find, on microscopic examination of sections, how infrequently the colonies are found in the walls of the abscesses, though the pus contains many granules. The surrounding connective tissue probably proves an effective barrier to the spread of the disease.

Simple opening, curetting, and drainage have proved sufficient in many cases; though recurrences may be frequent, healing eventually takes place. Where possible, excision of the inner half of the abscess wall or sinus is the best treatment. The danger from swallowing the granules, where the discharge empties into the mouth, is hard to estimate. Certain cases of generalized disease in the lungs, intestinal tract, liver, etc., occur in which the organism gains entrance into the food, or is swallowed; and, therefore, the surgeon should aim at making external drainage.

The individual case and the severity of the infection must decide between curetting and cauterizing the cavity with tincture of iodine or carbolic acid and a more radical incision. Iodide of potash, in doses of twenty grains three or four times a day, has distinctly influenced some cases for good, and should be used in connection with the local treatment.—*The Therapeutic Gazette*.

DEATH UNDER NITROUS OXIDE.

A STRANGE and, luckily, rare incident has lately occurred in the practice of Mr. H. D. Griffiths, of Newport. A young and apparently healthy man consulted Mr. Griffiths, who is an L.D.S.I. and an old-established practitioner, with respect to the extraction of some teeth, and it was decided to put the patient under an anæsthetic. Nitrous oxide gas, followed by ether, was administered by Mr. Griffiths, who was assisted in the operation by a nurse who had been some months in his employment. The report does not say whether she was a certificated nurse, but presumably she was a woman of experience. The patient took the anæsthetic well, and eleven teeth were extracted,—the operation lasting in all about three minutes,—the nurse using a Turkish sponge to absorb blood. The operation had been successfully completed and the young man had not fully regained consciousness, when, after a deep inspiration, it was seen that breathing had ceased. Mr. Griffiths resorted to artificial respiration and immediately sent for his neighbor, Dr. Stewart Vines, who came in about five minutes, and joined Mr. Griffiths in his efforts to restore animation by injecting stimulants and by every means known to them. All was in vain, as the patient never regained consciousness. The inquest revealed the cause of death, as the sponge which had been used by the nurse was found firmly impacted in the air-passages. The nurse had quite forgotten that she had left the sponge in the mouth of the patient, who with a deep inspiration had drawn it down beyond the point from which it could be observed, as Mr. Griffiths had examined the throat to see if there was any obstruction.

The coroner, in summing up, expressed sympathy with the deceased and his relatives and also with Mr. Griffiths, to whom he imputed no blame, and the jury brought in a verdict of “death by misadventure.”

We unite with the coroner in his expression of sympathy, but we cannot but think that this sad case teaches us all the lesson we are so apt to forget,—that our operations are conducted over a cavity, the importance of which cannot be exaggerated, namely the glottis, into which any object, however trifling, falling, may cause death. Instances are not wanting in which a tooth, the broken beak of a forceps, and other objects have fallen with fatal results; while in many cases these results have only been obviated

with great difficulty. Even in such a simple case as touching a tooth with a stick of nitrate of silver, insecurely fastened, the stick has slipped down, doing considerable damage. The most important factor in counteracting untoward accidents is to recognize the cause and remove it. In the present case the cause was not discovered until too late. Prevention is better than cure, and the fauces should be guarded by every means in our power. In extraction, the finger or thumb should be always interposed between it and the tooth; in applying medicaments to the teeth, care should be taken that they are firmly held by the carrier; and in the case of mouth-props and sponges, they should never be used without being attached to something which will render them easily recoverable. If the object has gone out of sight, prompt action is of vital importance, the first being that of inversion of the patient, followed by tracheotomy if necessary.

While regretting this sad incident, if it impresses these lessons upon our minds it will at least have been to us of some value.—*Editorial in British Journal of Dental Science.*

Reports of Society Meetings.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology of Philadelphia was held at the rooms of the Academy, 1731 Chestnut Street, on the evening of Tuesday, December 28, 1900, the President, Dr. J. T. Lippencott, in the chair.

A discussion was held upon the paper read at the previous meeting in November, by Dr. W. Leon Ellerbeck, entitled "Instrumental Précision in Dental Practice: A Review of some of the Investigations of Dr. G. V. Black."

(For Dr. Ellerbeck's paper, see page 1.)

DISCUSSION.

Dr. Curry.—I have not very much to say, but this seems to be a case where the "last shall be first." The length of time that has elapsed since the reading of the paper obscures many points,

though I listened attentively. I think that we must all agree that the preparation of the paper required a great deal of work, and I am glad of having had the pleasure of listening to it, but I believe many here will differ from the essayist in a number of his conclusions.

For myself I must say, it is very hard for me to believe that soft teeth are hard and hard teeth are soft,—that is, that all teeth are alike as regards their conditions. I do not think there has ever been any argument as to the percentage of organic and inorganic materials, but I think we all recognize that there are good teeth and poor teeth as we speak of them clinically, and we agree that the treatment ought to be according to our judgment based on clinical experience, not according to the conditions which reveal themselves to the chemist in his laboratory. I presume the brain of an idiot and the brain of a sage would be practically the same in a chemical analysis, and yet they would certainly deserve different treatment in the individual.

I do not think that it is necessary to condense gold fillings solidly all the way through. I do not believe it is even good treatment in all cases. Fill the cavity half-way with soft gold and finish with cohesive. I found in the mouth of a patient, a gentleman of sixty-five years, a soft gold filling which had been doing service for forty or forty-five years. It had been put there by a travelling clock-tinker. I could stick an excavator in it anywhere, but it was saving the tooth, and I left it there.

I have never seen an amalgam filling crushed in the tooth, and I have seen fillings that have been doing service for a great many years, which were made of very poor material.

In his original paper Dr. Black says he finds the phagodynamometer unsatisfactory in testing the strength of the jaws. If so, I do not see why so many accurate scientific conclusions can be based on its workings. I do not see how, from a clinical standpoint, Dr. Black's papers have been "a godsend to the dental profession."

I would like to ask the essayist if he has ever seen the poorest amalgam,—that is, what he would call the poorest,—made from the worst formula he knows, crushed in a cavity that had been properly prepared and filled.

Dr. Register.—This is an extremely interesting subject. I have read Dr. Black's work with a great deal of profit, and com-

pared it with that of some of his predecessors, who have not given us the same experimental explanations. I think, however, that scientific men, in following up the pursuit of special study, discover a swallow and think they have found a summer. Dr. Black may see more than one, but the summer of perfect knowledge on this subject is not yet. There is one part of Dr. Black's experiments that impressed me more than all others, and that was that the analysis of tooth-structure is the same in all the different stages of life. I think that impressed me more than anything else that Dr. Black made known. I have given the subject a little attention since, and the information I can obtain seems to imply that the tissues of the body are all that way, whether the individual be young or old, weak or strong; the analysis of the part varies little. We know the physical conditions are not the same, they running through the whole gamut of potential energy. Now, should not this difference in physical manifestations, as clinically observed, claim our attention and guide our practice, rather than results secured from devitalized conditions, no matter how perfect they may be? A neurologist of this city, in speaking of the teeth from a diagnostic point of view, said that the subject had interested him, because he had noted in many brain and nervous troubles the nutrient or trophic nerves presaged the consummation of certain conditions; for instance, in such a condition as locomotor ataxia, several years before the individual would be fully affected the teeth were among the first to show evidences of the coming dissolution. May not this trophic influence be credited with gum and root diseases, particularly recessions? Dr. Black made a remark concerning alloys that impressed me very much. He said that in copper amalgam there is a fixed condition, not subject to change. Now, that is the one alloy which we know to be a true chemical compound, and when it is brought into juxtaposition with dentine prepared to receive it we know through clinical observation that this statement is a fact, and copper alloy is the one chemical compound we have to-day, all other alloys we are using being mechanical mixtures. May not the flow he lays so much stress on be due to the natural tendency of the amalgam and the character of the chemical union of the alloy and mercury? To remove oxidation that exists and bring the components of the mass into actual contact at the time of using, alcohol washing, although not new, is strongly urged, as making the molecular union more absolute.

Fillings thus washed not only present a much better appearance than those that are not so treated, but the operation bespeaks tooth preservation. I think there is a great opportunity for an alloy that will have the advantages of the copper amalgam without its disadvantages. I am using one that is a close running-mate, and Dr. Black is its author.

Dr. C. N. Peirce.—The paper to which we had the pleasure of listening a month since was certainly a very carefully prepared review of Dr. G. V. Black's investigations, and to the essayist of that evening we are most emphatically indebted for his painstaking effort. But to commend the author of the paper read on the 26th and to criticise Dr. Black's work and deductions are two widely different functions.

With Dr. Black's microscopical work every dental student has for years been somewhat familiar, and with pride and pleasure has the speaker many, many times referred to his unsurpassed technique. Certainly no one has done more accurate and valuable work than Dr. Black in the preparation of sections of teeth.

In the papers under discussion the doctor abandons the instrument, with which he was as familiar as a child is with his toy, and brings to the dental profession a series of papers on the analysis of tooth-structure and material for tooth-filling,—deductions based on an "instrument of precision," this instrument differing widely in its construction and manipulation from the microscope, and I think I may add, far more unreliable in its demonstrations.

I shall not attempt to respond in the order in which the essayist presented the salient points in the papers, but rather in the order of their importance. Says the essayist of the evening, "It was conclusively proved that there was no withdrawal of lime salts from the teeth of women during pregnancy."

Does not the author of the paper recognize this fact, that the law of reproduction is that the embryo shall be nourished even at the sacrifice of the mother, and that while thousands of mothers bear children without any nutritional disturbance, there are other thousands who suffer gastric disturbance and other functional derangements, which are in their effects a serious tax upon the nutrition of the mother? So with this condition prolonged for months the embryo is feeding, fattening, and growing at the expense of the mother. Specialists in obstetrics recognize this when they state that the bones and teeth, as well as the soft tissues,

suffer—I will not say in their density, but in their bulk and conformation—during this period of gestation. The essayist, or, rather, the author for whom he is speaking, makes one vital error when he assumes that the decalcification of the tooth necessarily lessens the density of what remains. Not so at all. The lime is carried from that part which is in close contact with the vascular pulp, and if Dr. Black has had the same experience that some of us in Philadelphia have had, he would never have made the assertion that he conclusively proved that there was no loss of lime from systemic conditions. Any observing dentist who has had nearly fifty years of active practice has seen pulp-chambers enlarged, as well as lessened, in quite a limited period. Therefore the statement that there is no withdrawal of lime salts from teeth during pregnancy or any other condition of life, is made from limited knowledge and hence is not authority. Of variations in percentage of lime salts this remarkable statement is made: “The greatest variations were in the different teeth in the same individual.” Remarkable, because it could not be otherwise. Does not Dr. Black, as well as his representative, appreciate the fact that the large majority of individuals use only one side of the mouth, just as they use one eye or one ear? Use and disuse come in as an important factor, and though the difference was ever so slight in density of structure, it would, without any doubt, be exaggerated in that locality where the function of the pulp was the active agent in the change. “The elasticity of dental tissue did not depend upon the density of the teeth, or upon the percentage of lime salts, yet it apparently varied somewhat according to the condition of the organic matrix.” This is a very important admission, and it is the key to the predisposition of the teeth of the young to decay. His instrument of precision may or may not demonstrate the density of the teeth of children. What I do know is that the organic matrix, for want of use, is not performing its normal function, hence from the absence of this continuity which should exist between the mineral and organic structures the teeth yield to the ravages of decay, which can (I speak advisedly) be checked, if not entirely arrested, by the function of mastication being fully performed.

“The presence or absence of caries is in no way a factor in determining either the hardness or elasticity of tooth-structure or *vice versa*.”

Probably this is true, but Dr. Black has prepared sections of dentinal tubuli to but little personal instruction if he does not know that the slow progress of dental decay will, without any doubt, increase the amount of lime salts not only in the tubuli, but also on the periphery of the pulp to the protection of that organ from exposure at the point to which the decay is progressing.

“The prevailing idea of white teeth being soft was found to be an error, an example of such resisting a strain until the application of three hundred pounds.”

What has the resistance of three hundred pounds to do with the experience of thousands of dentists? The arches formed by the tubules may resist twice that strain or force, but this statement will not interfere with the fact that the progress of dental decay meets with less resistance in white teeth than in the majority of yellow teeth. The facts are adverse to Dr. Black's deductions, and from our present knowledge the teeth themselves are responsible for the facts.

“The active cause of caries is a thing apart from the teeth themselves, acting on them from without.” This is probably true, for the enamel possesses but a trace of organic matter and but slight circulation, but if from this the inference is to be drawn that systemic conditions influencing subjacent tooth-structure is not a predisposing factor in the progress of dental decay, the evidence is against it. It is only necessary to recite one instance that has been the experience of many in practice. Attention by a patient is called to a certain locality in the mouth where condiments or sugar give a sensation of pain. On an examination the zonal line between enamel and cement may give evidence of a decided exalted sensibility. The transmission of touch to the brain is unmistakable, and unless great care is exercised decay results in a limited time. Now, the contention is that the predisposition is not wholly from without. Indeed, it is a question whether the previous or present systemic condition is not responsible for the exalted sensibility.

As the doctor's “instrument of precision” has fully proved that there is no perceptible difference in the density of teeth, he can well afford to say “that there is no basis for the supposition that calcic inflammation of the peridental membrane or phagedenic pericementitis attacks persons who have dense teeth in preference

to those whose teeth are less dense." This point will not be contested, but the following is true: The large majority of teeth affected with "phagedenic pericementitis" are of yellow color, and at the time of the attack are, to a *limited extent only*, the seat of dental decay.

The experiments performed in the condensation of gold-foil, and the advantage of adhesive foil over soft, in the preservation of tooth-structure, are so entirely without practical value in tooth salvation that they are worth but little time in discussion.

That there have been more worthless fillings inserted with adhesive foil than with soft foil cannot be truthfully contradicted. That with hand-pressure in the use of both materials there can be as much gold in weight packed into a given space with soft as with adhesive gold cannot be denied, and that soft foil more readily adapts itself to the walls of the cavity is also true.

Dr. Luckie.—I am very glad that Dr. Black's articles that appeared five years ago are being reviewed. The review has been quite a long while in coming. The society should be congratulated in having a member who can make these tests, as demonstrated at the last meeting, and I think it would be well if the fillings introduced into the steel matrix were made by different members of the society and their strength tested here. Dr. Peirce makes the assertion that he can put more soft gold than cohesive gold into a given cavity. It might do well to test the strength of that gold. He speaks of being a lover of soft gold. I am a lover of soft gold, and use more soft gold than cohesive gold. I would like to have some of my fillings tested. With soft gold you can make contour fillings, and they are apparently as strong in the mouth as cohesive gold. I think it would be a good thing to continue the experiments in that direction and have further discussion.

Dr. James Truman.—Mr. Chairman, I did not care to talk on this subject to-night, for the reason that I have written a good deal upon it, and, therefore, it places me in the position of repeating myself. At one time, five years ago, when Dr. Black presented his series of papers, I, with a number of others, replied to them and criticised them, and among replies that I made at that time were that Dr. Black in making his experiments failed, so far as my understanding went, to so explain the beginning of his experiments that we were left in doubt. He stated that all teeth had the same amount of density, that there was no such thing as soft teeth as

was understood by the profession generally, and hard teeth, but all teeth had the same amount of calcific matter. I then stated that, in my opinion, the method that he adopted to secure teeth was open to criticism; that he had individuals send him quantities of teeth taken from various mouths and of all ages, but without any regard to the character of the teeth, as this has been generally understood. He placed all those teeth under experimentation and consequently the result was as he stated. Now, as I understand it and as every one else who has practised dentistry for many years understands it, there are teeth that are soft and chalky, that cut under the instrument almost like cheese, and others that present great resistance to cutting force. The environments do not seem to have much to do with this. Now, those soft, chalky teeth are not to be had extra-orally. I do not suppose any experimenter could possibly secure a sufficient number of that character of teeth with which to make laboratory experiments. Dr. Black says they are white teeth. I do not observe that they are white teeth; they are more like mother-of-pearl. What was his answer to that? He says that Dr. Truman was the only one of all his critics to make that criticism. That may have been true; so far as I know, it was true; but does that invalidate the criticism at all? Not as I view it. He failed to reply to this objection. Therefore I hold that his experiments at the very start were defective and lead to wrong conclusions.

Another point relates to his instruments. Does any one know that they register with absolute accuracy? Dr. Black does not prove it. He says his different instruments give certain readings, and we are supposed to accept those statements as absolutely correct. Now, I, for one, am not prepared to accept them at their face valuation. There are some statements made in his paper that to my mind are impossible of belief. In a recent paper, published in the December number of the *Dental Cosmos*, and read in October before one of the New York State societies, he goes over a good deal of the same ground, and says, among other things, that the saliva is acid. He does not say it in so many words, but by implication, because he quotes from the statements of others and seems to endorse them.

What do we mean by the saliva?

It seems to me there is a great mistake made by men who talk about the "oral fluid" being the "saliva." It is not saliva; that

is, it is not wholly saliva. The saliva, from my very earliest recollection and knowledge of dentistry, has always been stated as being alkaline. I make a distinction between the oral fluid and the saliva proper, as the latter enters the mouth from the ducts. I have been testing mouths for many years, and I have never yet found an absolutely acid condition. The oral fluid is neutral, and it was this reaction that led to experiments at night to find whether any change took place then in a condition of rest, and I invariably found an acid reaction during the night. This is now generally accepted, that the night season is the time for acid production. I never, however, received any credit for that work.

In regard to Dr. Black's force in mastication, is there any one who can accept his gnathodynamometer readings? He mentions that the force of two teeth coming together is probably equal to three hundred pounds. Does anybody believe that?

I did not feel like talking to-night, because I do not regard it as proper to answer a man who has secured certain results through laboratory work without going through a similar series of experiments. After hearing Dr. Ellerbeck's very excellent *résumé* of Dr. Black's paper, I had some idea of having an instrument manufactured for the purpose of repeating these experiments. But I found the time was too short before the present meeting to accomplish anything, so that I am obliged, like the rest of you, to come here to-night and talk from clinical observation, or, rather, from common-sense observation.

A recent writer in the INTERNATIONAL DENTAL JOURNAL, Dr. B. F. Arrington, of Goldsboro, N. C., was so impressed with these statements of Dr. Black's that he engaged a boy to crush hazelnuts and lemon-drops, as described by Dr. Black in his original article. He kept him six minutes crushing one hundred and fifty lemon-drops, and the same time crushing hazelnuts, and, if Dr. Black is correct, it took a force for each hazelnut of one hundred and forty-nine pounds, and sixty-five pounds for each lemon-drop. The total of that boy's twelve minutes would be over thirty-two thousand pounds. Just think of it, thirty-two thousand pounds of force in twelve minutes! Is there not something wrong about Dr. Black's gnathodynamometer? Just think of such a force used by a child! And he makes no exception. He says, from one hundred and fifty to four hundred pounds crushing stress between two teeth. Dr. Arrington tried to have the boy lift a weight of seventy

pounds. He could not do it, and yet he was crushing, according to Dr. Black's article, at the rate of probably three hundred pounds every time he brought his jaws together.

Now, is it reasonable that the pterygoid and masseter muscles should be able to do more than that child, or than an individual could, in raising the weight, when all the muscles of the body are in force at the same time? You know what a strain it would be to lift three hundred pounds.

The whole thing to me, without testing, seems absolutely impossible of belief. I cannot accept it until I first know that the instrument that is used to demonstrate this has been thoroughly tested as to weight. I do not know whether Dr. Black has done this or not. If he has, there is probably some error connected with it.

A matter has been brought up here which is hardly germane to the question, that of filling with soft foil. I, like Dr. Pierce, was trained in soft foil. There was nothing else in our earlier days, and we thought we could make gold fillings fairly solid. I question, however, whether it is possible to pack in a matrix soft gold-foil of the old style as solidly as you can pack cohesive gold with an equal degree of care. I do not want to enlarge on that; it does not particularly belong to the question at issue. I tested, some thirty years ago, this whole matter of filling, and had all the fillings weighed at the United States Mint, and I think I know something about the difference between hand-pressure, pressure upon soft base, and condensation made by the electric mallet.

Dr. Roberts.—There have been many points brought up in this discussion. Referring particularly to the question, Is the enamel a lifeless or a live tissue? If it is a live tissue, and receives nourishment after it is once formed, then systemic conditions may affect it. If not, they can have no effect upon it. The question, then, is purely one of environment. Whether the tooth is hard or soft can make no difference. It is simply that the environment is changed, according to the systemic condition. I think the statement was made that the pressure for packing amalgam was fifteen pounds. Is this meant to be fifteen pounds to the square inch, or fifteen pounds to the one-hundredth of a square inch? With regard to the density of your filling, it depends very much upon whether the cavity has four walls and a bottom or whether it has not. The soft or cohesive foil, that can be almost perforated with an in-

strument, if placed in a cavity such as you get in a steel matrix, cannot be crushed, though not very solid. There is only one way possible to make it give or break, and that is by forcing something smaller than the cavity into your matrix or tooth. I have seen in the mouth amalgams which you cannot call crushed, because they are not crushed. They are rubbed down, worn down, mashed to one side, rolled out, hammered out, if you choose; they are not crushed to powder. I believe the weakest amalgam that you can get that does not disintegrate in the mouth, as the copper amalgams will, is amply strong for all cavities in the mouth, excepting where contour fillings of great strength are required. The work of Dr. Black, I think, has been of great benefit to the profession. In some directions it has brought out thought. It has brought out the proper formation of cavities better than anything else has ever done. The enamel is practically valueless to hold or retain the filling. I am very glad that Dr. Ellerbeck was able to give us so complete a *résumé* of Dr. Black's work, and I thank him for his paper.

Dr. Ellerbeck.—I have prepared myself only as the discussion has advanced, and would not speak but that statements have been made which, if permitted to go unnoticed, might create injustice to Dr. Black. It seems that in the main those most vehement in the denunciation of his work are they who have given it the least study. Those next in error are they who look upon it with biassed minds, and give but little credit for practical value to Dr. Black's work as a whole, preferring to note a few points of minor importance at variance with their own beliefs, and, not accepting these, denounce the results of his patient efforts as of little or no importance to the dental world. Dr. Black is made to say things which, as a matter of fact, he does not say or believe. It is common to hear that he believes the teeth of the youth and the teeth of the adult to be of the same density. In fact, Dr. Black's belief distinctly is that teeth of different ages *do* differ in density, so slightly, however, as not to account for the tooth-tissues in themselves being responsible for any predisposition to assume pathological conditions.

The main line of argument to-night has been the expression of individual opinions based upon clinical evidence alone. While it would be hardly proper to say that the observations which the gentlemen have cited are wholly wrong, still, as opposed to them we

must not overlook the fact that Dr. Black has had some forty or more years of active practice, and no one perhaps in the profession has been more keenly alive to clinical evidence than he. Perhaps no one has kept more careful records. Along with this he has instrumental evidence in support of his conclusions, and while not overlooking the fact that we may at times be right, the mere unsupported statement that we do not believe is not sufficiently scientific to have any weight as argument. It is claimed throughout a certain section of the country, where the later principles of operative procedure are more generally in vogue, that the clinical evidences are clearly vindicating the instrumental evidence and better operating is being done. The clearest proof of the truth of principles is in their successful practical application.

As to the resistance of teeth to cutting instruments, let any one prepare slabs of dentine free from carious infection, and from different teeth clinically known as hard and soft, and, having mounted them in a way that they may be firmly held, let him close his eyes and, not knowing which slab he has selected, endeavor to distinguish between the different specimens by their resistance to cutting instruments, using for the purpose sharp, square-end hoe excavators. The number of errors he will make in a hundred trials may convince him that the difference is not so great as to be readily appreciated by tactile sense.

Dr. Black's argument is almost wholly along the line of a systemic influence having to do with the beginning of the carious process, something operating through the oral fluids or saliva being the essential predisposing cause. I specify saliva in answer to the remark of one of the gentlemen questioning Dr. Black's use of the term oral fluids, for, whether it is confined to the saliva or not, the point is hardly well taken, for certainly the saliva would contaminate the oral fluids, and surely this would not render the predisposing causes inoperative.

As to the statement that Dr. Black does not believe in the administration of medicinal agents for the prevention of decay, I have observed no statement of his to this effect. On the contrary, my understanding is that he argues the possibility of the administration of some antitoxin along the lines of serum therapy being the possible solution to the great question of prevention of tooth decay. From the recent experiments of Michaels, of Paris, it seems that Dr. Black's suspicions are to be realized, and that the

predisposing cause of caries is to be found in the saliva, which is contaminated in varying quantities with histo-chemical products, due to physiological changes accompanying various diethetic conditions, the chemical products in turn influencing bacterial growth. Where the gentleman has perhaps gotten his misunderstanding is in Dr. Black's statement that he does not believe that the administration of lime in solution with a view of preventing the withdrawal of calcified matter from the teeth of pregnant women, or of producing better calcified teeth in the offspring, is of any value. Dr. Black, of course, arrives at this conclusion because of his determining that there is no withdrawal of lime from the teeth of pregnant women in any event, and while he offers no objection to the administration of lime-water as a neutralizer to hyperacid conditions, he thinks the claims made as to its possible physiological assimilation are absurd. While organic substances containing calcium salts in complex molecules may tend to furnish the lime for both bones and teeth, its assimilation only affects the rapidity of the calcification and not the extent.

One of the gentlemen stated that the brain of an idiot and the brain of a sage, whilst of the same chemical composition, would certainly deserve different treatment.

Now, if we were to liken the different brains of the individuals to the pulps of teeth, and fractures of the skull as like unto carious cavities, I believe the treatment by surgical trephine would in both cases be conducted similarly.

I call attention to the argument that since amalgam fillings rarely crush under the force of mastication, a filling which would withstand two hundred and forty pounds pressure can with impunity be used, and that there is no necessity for a higher crushing stress. It is about as sound argument to say that because we can subsist on a milk diet there is no occasion for better food, since this will maintain life. We are in duty bound to render patients our best service, and while a filling which would withstand a pressure of two hundred and forty pounds without crushing might be a continual menace because of its liability to flow, with high crushing stress we have a minimum degree of flow, from which it is evident that high crushing stress is not the only requirement, but, while being of considerable advantage, it is the best means of guarding against the disadvantages of flow. While perhaps not always true, as, for instance, where the modifying metal induces

weakness, low crushing alloys contain too high a proportion of tin, consequently, besides their weakness, they usually shrink perceptibly. Some of the high-class alloys crush at approximately four hundred pounds, but flow only from one-half to one per cent., expanding a point or two at most; whilst some alloys, among them certain gold and platinum alloys, which have been sold in large quantities throughout the country, crush at approximately two hundred and forty pounds, flow from ten to twenty per cent., and shrink ten points. As these high-class alloys and low-class alloys sell at approximately the same price, and the attributes are all in favor of the high-class alloy, except ease of insertion, it is evident that we should employ them. True, they require considerably more manipulative ability for their insertion and considerable practice to obtain the best results, but we cannot excuse ourselves because of lack of manipulative ability. I believe that Dr. Black's latest experiments go to show that twenty pounds pressure with a special plugger is required to produce the best results. The form of the plugger he is modifying in accordance with his findings.

In relation to copper amalgam, I think the gentleman who made the statement that copper is the only metal to unite with mercury chemically would find some difficulty in supporting his opinion. There is some conclusive proof that gold and silver unite with mercury in atomic proportions; in fact, the definite chemical compounds of each may be isolated.

One of the gentlemen argues that he can make as dense or a denser filling with soft gold than can be made with cohesive. Therefore he does not hesitate to make the bulk, if not all, of the filling with this material. In non-cohesive gold the individuality of the leaves obtains, and there is no cohesive condensation through intermolecular contact, as would appear to be the case with fillings made of cohesive foils. Besides, even were it possible to obtain the same density with soft foil as can be obtained with cohesive, this, while necessary, is only of even importance as regards fillings in occluso-proximal cavities, for here there is much wear, and rigidity, which cannot be obtained with soft foil, is of great importance. While there is no objection to a thin lining of soft gold, it should certainly be used only in small amount, lest it materially weaken a filling much exposed to wear. One of the experiments conducted here before the Academy at the last meeting shows to some extent the difference between non-cohesive and cohesive gold as regards

resistance to crushing stress. A filling 0.08 of an inch cube, largely non-cohesive gold, finished with cohesive,—such a method as suggested by the gentleman as being his preference,—shortened approximately twelve per cent. under a pressure of two hundred pounds, while one of the same dimensions, made of cohesive gold throughout, shortened only four per cent., though it has been determined that a *thin* lining of non-cohesive gold seems to make but little difference. So, if we wish to use any soft gold with a view of securing better adaptation at the cervix, it is well to limit the amount.

One of the gentlemen states that he can see no practical value in Dr. Black's work. I trust that a further study of it may be more convincing.

Dr. Black's system of cavity preparation in accordance with the principles of physics, and his methodical procedure in their preparation, savoring of accuracy and despatch; his determination of the strength requirements of the filling-material to the strength of teeth and strength of bite, and the best means of securing this strength, both in amalgam and gold; and, withal, his system of nomenclature, which enables us to communicate understandingly methods of procedure and exact tooth areas operated on without necessity for diagrammatic explanation, must appeal strongly to the scientific; and while there may be some weak points, its universal adoption until something better is presented would be of benefit to the whole profession, since it would reduce methods of procedure to a systematic and definite basis.

There are many things about which I would like to speak, but I feel that I have about used up my apportionment of time. One thing of interest, and of which I will speak, however, is of the experiments with gold fillings inserted in a steel matrix. The cube cavity is formed by three pieces of steel, accurately ground together and clamped. In filling this cavity with gold, using the amount of care usually bestowed by careful operators, it is found that, notwithstanding the accurate fit of the different pieces of steel used to make the cube cavity, the gold will flow out into the crevices, filling the angles perfectly. How often we have heard the statement, Do not attempt to fill into an angle. As a matter of fact, it is found that we can fill perfectly a cube in which there are many angles, and this is of interest because a square is the most retentive form of cavity, and while we would round out angles in

enamel margins, the method of preparing in molars and bicuspid a flat cervix to keep the gold from condensing upon itself, together with a square arrangement of the cavity, in itself retentive, and in addition an anchorage in the occlusal portion to prevent tipping, is scientific, presents the attributes of ease of insertion, and undoubtedly adds durability to the filling. It is necessary, in order to make a groove, cut with a round bur, retentive, that it be sunk in the tooth-structure over half its diameter; whereas, in the method of using small, square-end hoe excavators to make the under cuts, as, for instance, in weak incisors, the grooves made, however shallow, are retentive. Their proper placement along the palatal and labial dentinal walls, as compared with burred grooves, is conservative of tooth-structure, and they are equally if not more retentive, and we have learned that they can be perfectly filled.

One of the gentlemen has questioned the accuracy of Dr. Black's instruments, particularly the gnathodynamometer used in determining strength of bite. He says he is of the belief that the jaws are incapable of exerting a force of three hundred pounds, and cites in proof an experiment conducted by Dr. Arrington, of North Carolina, who hired a boy to crack hazel-nuts and lemon-drops breakable respectively at one hundred and fifty and sixty-five pounds, and found that the boy in the short space of twelve minutes cracked one hundred and fifty hazel-nuts and one hundred and fifty lemon-drops, which, multiplied by the stress required for each, would, as "claimed and proclaimed by the converts and advocates of the phagodynamometer," be equivalent to about thirty-two thousand pounds,—sixteen tons of work done in twelve minutes,—which he thinks physiologically impossible and absurd. As a matter of fact, at least some "advocates and converts of the phagodynamometer" do not get so far astray on their understanding of the laws of mechanics as has Dr. Arrington, and are able to distinguish between work done—foot-pounds per minute—and static pressure, which latter is the simple but conclusive explanation of how the converts and advocates of the phagodynamometer do explain the physiological phenomena.

To them the physiological possibility is as easily apparent as Dr. Arrington, whose experiments have been cited, thinks it difficult to conceive. In pressing down a pound or a fraction thereof more than is necessary to crush a nut or a lemon-drop, much energy as to work is not necessarily expressed. Internal work in maintain-

ing static pressure, as, for instance, in cracking a nut, is not expressed in foot-pounds, but is almost wholly expressed in heat. However, why compare the strength of the different body muscles when some are designed for one purpose and some for another, some for work and some for maintaining static pressure? And, too, there is evidently a quality in muscle according to its arrangement,—length and breadth of fibre and the effectiveness of the levers which these muscles operate. On the one hand, a flea can jump many hundreds of times his length; his bite is also effective, but he would find locomotion difficult were he hitched to a pin. Again, a crab can exert a force with his claws so great that our whole efforts are necessary to secure our freedom when once within his grasp (static pressure and analogous to strength of bite); yet the crab weighs but a pound or two, and while not a scientific comparison, but analogous to Dr. Arrington's reasoning, a crab could not move a brick to save his shell. While not confusing foot-pounds with static pressure, and not overlooking the different purposes for which men and crabs were intended, comparing the size of a crab, his ability to perform work, and claw strength with man and his ability for work, what might we not expect man's strength of bite to be? Three hundred pounds is but the degenerative result of a higher civilization, and no doubt low compared with the jaw strength of the preadamites.

As for the phagodynamometer being too inaccurate to warrant scientific conclusions being based on its workings, all evidence goes to show that if it is inaccurate it does not register the full force of which the jaws are capable, for the peculiarity of its construction necessarily keeps the jaws apart, and it operates therefore at a disadvantage.

In conclusion let us consider the exception taken to Dr. Black's argument that there is no basis for the statement that phagedenic pericementitis most frequently attacks dense teeth. The gentleman who takes issue with Dr. Black's view states that he has examined perhaps as many cases of phagedenic pericementitis—so-called pyorrhœa—as any man living, and that he has found in the great majority of cases that dense yellow teeth of a bilious type have been the ones affected. The gentleman offers no proof that the teeth are denser as regards percentage of calcium salts or of a higher specific gravity. On the other hand, Dr. Black arrives at his conclusions thus: The average age of individuals whose teeth

are being lost through pyorrhœa is fifty years. The average density as regards lime salts of all teeth at the age of fifty years is 63.83. Now, the average density of teeth lost through pyorrhœa is within an inappreciable difference of a fraction of a per cent. the same. In other words, the density is only that wrought through the natural process of time, and normal for the age of the patient, having neither an undue percentage of calcium salts nor unusual specific gravity. So we cannot state that pyorrhœa attacks these teeth because of their excessive density. While not denying the bilious type as constituting the majority of teeth affected, let us look to another source for the cause of the affection. It is being found that diathetic conditions are largely responsible for the predisposition of teeth to decay. Diathetic conditions especially characteristic of the type or temperament mentioned by the gentleman may be largely responsible for a predisposition of the tooth membrane to become the seat of infection, thus inducing the pericemental disease.

Now, it seems that, so far as any argument or proof presented to-night is concerned, Dr. Black's experiments and conclusions remain unshattered. Let us not attempt to disparage scientifically deduced opinions unless we can present better ones similarly deduced, for by so doing we may unwittingly assist in the suppression of truths which might be of great benefit to ourselves, the rising dental generation, and the body politic.

OTTO E. INGLIS,

Editor Academy of Stomatology.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Boston, Wednesday evening, December 5, 1900, at six o'clock.

President Pond.—To-night we have a paper by Dr. W. E. Decker on "A Case of Orthodontia diagnosed and Progress watched by the X-Ray," a subject in which I do not doubt you will be deeply interested. I have the pleasure of presenting to you Dr. W. E. Decker.

(For Dr. Decker's paper, see page 141.)

DISCUSSION.

Dr. Decker.—I shall be pleased to answer questions on any points that have not been made perfectly clear.

Dr. Clapp.—Mr. President, I want to ask Dr. Decker if the pulp is still alive in the cuspid.

Dr. Decker.—So far as I know. The question has been asked me once or twice before, as it was brought down so rapidly. I watched it very carefully and often tested it. There has been no discoloration of the tooth, and I do not think that it is injured in any way. It was very much alive when I attempted to smooth the drill hole for a porcelain inlay.

Dr. Clapp.—The last time you tested it, was it all right?

Dr. Decker.—Yes.

Dr. Baker.—I think I can appreciate something of what has been done, and also the retaining of the teeth while he was waiting for the cuspid to come down, in such a way that nature would assist him. That is the vital point of his treatment. Any one who has done considerable regulating very well knows what nature will do to assist us, if we will only give her a chance. On the other hand, if he had retained these teeth in a fixed position, he would not have attained the results he has in the time it has taken to do this. I find that in retaining teeth it is a very important thing to give nature a chance to do its work to bring the teeth to good occlusion, and one will get much better results by doing so. I wish to thank Dr. Decker again for his valuable paper. In my opinion it is one of the best papers we have ever had before the society.

Dr. Fillebrown.—I observed the one specially new point that Dr. Decker has just alluded to, and I think it is well worth our remembering. That is, that he leaves those teeth on a hinge, so that nature can change the position of the roots after the teeth are put in place. Dr. Decker has demonstrated that nature will regulate a root if you only give it a chance after the crowns are put in place. That seems to me a decidedly original affair, and the most so of anything that we have had before this society in a long time. I compliment him.

Dr. Andrews.—I think, as has been said, that Dr. Decker's paper is one of the best we have had presented before us. I can appreciate parts of it. Some twenty years ago I brought before the Massachusetts Dental Society the case of a lady who said that

she had never had a left superior permanent cuspid. I carefully examined her mouth, and made up my mind there was a cuspid in the jaw. I had at that time no X-ray to assist me. I made an opening in the jaw, and found that there was a cuspid tooth lying in a horizontal direction, and I opened to it and proceeded a good deal as the essayist did. I put a screw in and drew it down in place, and I must have turned the tooth, I should say, more than half an inch in the jaw tissue. I brought it down in place, and the tooth is there to-day, and I believe alive, strange as that statement may seem. It was certainly alive after I got it in place. I tested that when I filled the little cavity that I had made with the screw. The screw had worked loose, and I thought it best to fill its cavity. The tooth has grown in its new position solidly. The patient was not a young person. I should say she was twenty-four years of age when the operation was performed.

Dr. Smith.—It is such an easy matter to be misunderstood, that I rise to correct—or to be set right if I am wrong—the remarks that Dr. Fillebrown made in regard to the originality of the adjustment of this appliance so that the roots would move. This is not the first demonstration that the roots of teeth, as well as their crowns, can be moved. This has been amply demonstrated in recent publications. I sometimes think that the man of to-day who regulates teeth deserves quite as much credit in selecting the proper appliance from the many different devices as if he invented any new appliance himself.

I cannot see, however, but what we would get a similar effect, so far as tipping the points of the incisors in is concerned, if we used the regular old-fashioned vulcanite plate; you would certainly get the fulcrum. With the pins resting against the teeth there is a less amount of contact and a condition favorable for this oscillating movement.

This, Mr. President, is certainly a very interesting case. It has been handled in a most scientific way and has been presented in a most interesting manner, and shows the important strides that have been made in orthodontia.

Dr. Clapp is to show here, I believe, some negatives. One of the negatives is that of a case in which I am interested, and I thought the members might be interested to see the result in that case, and so I shall be pleased to show the models after Dr. Clapp has shown the negative.

Dr. Fillebrown.—My remarks applied to the method of retaining. Is not that a new thing?

Dr. Decker.—I have never seen that used, that I recall. I was casting about for some way of getting an arrangement upon all the teeth, yet which would not be rigid. I wanted tubes there because I wanted the teeth to swing. I did not wish to resort to Dr. Casey's method of moving the power up opposite the weight, because I did not want the patient remaining in the city so long when a fulcrum retainer and nature could be gradually doing the work for us. It seemed reasonable to me that if the arch would fall under the gentle pressure of the lips when teeth are extracted, this same pressure could be utilized in straightening teeth. The use of the tubes in this manner is certainly a very easy way of getting them in place. They were originally short solid tubes, each one opened by holding on the point of an instrument over a flame until red, then quickly pushed farther onto the tapering instrument, which opened it where it had been soldered. Then each was soldered with the back of the tube to the band, and each band set with the tube on the labial surface of the tooth. As the wire was slipped into the tubes on the posterior teeth, it fell right into the opened tubes on the anterior teeth. As I say, I do not recall ever seeing it used.

Dr. Ainsworth.—I want to add one word of appreciation and commendation of the paper. It is certainly an excellent result. One point I feel like emphasizing is the importance of doing this work slowly. We often hear of remarkable results being accomplished in a very short space of time; but I think it is a great deal better to go slowly and have the advantage of nature's assistance, which she freely gives when you work in harmony with her. If you have a tooth to elongate, it can be accomplished in a very few days, but in doing so you are very likely to draw it out of the process, and the process and gum are very slow to come down and cover the tooth, as they would if moved gradually.

I have found it a great advantage in cases where I am expecting nature to come to my assistance in a change of the process, to carry the case part way, and then leave it for some months, or through the summer vacation, and feel that I have accomplished results that could not be accomplished if the work was commenced and kept on continuously until completed.

This case shows a wonderful accomplishment, and suggests

how much cases that we meet every day in the street might be improved if the public only appreciated the possibilities.

Dr. Smith.—I would like to ask Dr. Decker if he had any trouble in controlling the bleeding while setting the post into the tooth.

Dr. Decker.—Yes, I did. I went about that in a rather slow way, also. I did not set the post the day I did the lancing. After lancing, and chipping away the bone, I discovered my tooth, and put in a tent of cotton smeared with carbolized vaseline, to wedge the gum away, and I think it was two days later that I put in the post. Then it was a very easy matter to keep the tooth dry. The gums pushed away so that I could see it quite plainly.

Dr. Smith.—Did that post show?

Dr. Decker.—The hole is under the band at present.

Dr. Clapp.—I had the pleasure of watching this case from beginning to end, and I simply wish to emphasize the fact that this is the result of Dr. Decker's zest and patience and painstaking work.

Dr. Smith.—As the pictures that Dr. Clapp will show will probably lead to more discussion of Dr. Decker's paper, I move that we pass the subject.

Subject passed.

President Pond.—I have the pleasure of presenting Dr. Dwight M. Clapp.

Dr. Clapp (showing his negatives).—Here is a case of which Dr. Ainsworth can, perhaps, tell you something interesting.

Dr. Ainsworth.—I am sorry that I have not the models of this case here. It was a case of the right central standing next to the cuspid, and the right lateral immediately under the central. In place of the left central there were two supernumerary teeth. The left lateral was of good formation. The first question in my mind was which one of the supernumerary teeth we had best save and crown to match the other central. I did not believe, from the appearance of the case, that the other central was there; but Dr. Clapp's picture showed plainly that it was, but rather higher than the shadowgraph seems to indicate now. The two supernumeraries and the lateral which stood under the central were extracted. The belated central is now about half-way through the gums, and very much at an angle. We are just about adjusting an appliance to bring it down into place without drilling into it or in any way

marring its beauty. It is a very interesting case, but the models show a clearer idea of it than I can give you. It is a case that demonstrates most beautifully the advantages of shadowgraphs in this work.

Dr. Clapp.—Here is a case of a deformed tooth. I think that this slide was made by Dr. Ainsworth, and he will be able to tell you why he made it, and the result of it. Will you tell them?

Dr. Ainsworth.—It was a cone-shaped lateral, the tooth perfectly sound, but an alveolar abscess had developed above it, and I queried whether the pulp was alive. Before photographing, I attempted to find the pulp cavity by drilling, but failed. By the aid of the X-ray, however, I was enabled to locate it, and got well up to the apex. Later I put on a crown, which much improved the appearance.

Dr. Smith.—This model, the negative of which Dr. Clapp has shown you, shows no trace of the missing central. The lateral came inside the arch, striking inside the lower central, and the first move was to bring the lateral out. There was more or less fulness, of course, outside. Pretty soon the cuspid tooth came through, and it was at that time that I had the patient go to Dr. Clapp for the X-ray picture.

This model, No. 2, shows the cuspid directly over the lateral, and the point of the right central incisor erupting at right angles to the left central incisor. The gum was pressed back and a gold cap made to fit the point. Strange to say, that cap stayed there perfectly until I got that tooth down and turned into place. Unfortunately, however, the tooth is an entirely different shaped tooth from its mate. It is more convex on one side and more concave on the other. The negative slightly shows that the tooth is deformed, but I did not think so much of it at the time. I was careful to tell the patient that in case this tooth proved to be a deformed tooth, it was wise to put it in place, because the pulp could be destroyed and a crown put on the root.

This model, No. 3, shows the tooth in place. The pulp of the tooth was alive at the last test. The lateral incisor, as you will see, is not in place. The next move is to bring this lateral out and move the root out, and give that fulness which will very much improve the looks of the mouth.

Dr. Hopkins.—The question of preserving the tooth alive during manipulation is spoken of as rather remarkable, but I think, when

we remember the operation of nerve-stretching, we get a little light on this subject. You know frequently when the fingers become useless because of injury to the ulna nerve, the nerve is stretched, and during that stretching operation the surgeon does not hesitate to put on a pressure of forty or fifty pounds, and yet the nerve is uninjured and the patient is benefited. I think possibly the same thing happens in the more delicate nerve of the tooth, and that they will stand a good deal more stretching than we have ever thought it possible to apply without injury.

Dr. Fillebrown.—There is no tissue that is produced faster than nerve-tissue. You can sever the nerve and leave the ends a considerable distance apart. The space will fill up directly and the nerve perform all the functions of which it was capable before it was injured. So if you put a nerve on the stretch and keep it extended, it will elongate and that very rapidly. I think the trouble which so often obtains where you destroy the pulp by moving the tooth will be found in cases where the tooth is tipped and the nerve pinched. If you pinch it, you will produce strangulation, and of course a dead pulp. But so long as you keep the apex of the root free and clear from any pinching, and simply stretch it by moving the tooth, the nerve-tissue will be produced quite as fast as any of the other tissues. I think that is the true explanation of it, and why we can now do so much without menace to the life of the pulp.

Dr. H. A. Baker.—I did not fully appreciate the advantages of the X-ray in dentistry until quite recently. Something like six months ago a dentist brought his daughter, also models, to me for my opinion in a case of orthodontia. In place of a left lower second bicuspid was a temporary molar, and it was impossible to tell whether the bicuspid was beneath the molar or not. I advised him to go to Dr. Clapp and subject it to the X-ray, which he did, and yesterday he sent me a photograph of it which shows no indication of an approaching bicuspid. Had we extracted the temporary molar on the supposition that the bicuspid was beneath, it would have been bad practice. Now that the X-ray has shown there is no bicuspid, our way is clear, for the molar is perfectly sound and solid in its place, and in my opinion we will obtain much better results by letting it remain than to have no tooth there at all.

Subject passed.

INCIDENTS OF PRACTICE.

Dr. Brackett.—I had a little incident of practice this afternoon that pleased me. A young lady came from school at two o'clock to keep an appointment of an hour and a half. We had a storm of sleet, and she came without rubbers, with damp feet, and sat down in my chair in a very uncomfortable and unsafe condition. Seeing her uncomfortable, I was uncomfortable myself, and I turned over in my mind several plans for trying to help her. Finally, I remembered that I had in the house an electric foot-warmer that for its operation simply needs connection with any lamp-socket. I made a connection, put the little flat stove on the foot-rest of the chair, and very soon her feet were getting dry, and she was warm and comfortable. The cost of this electric heater was about six dollars. They may be procured of any dealer in electrical apparatus, and are convenient and serviceable wherever electricity is installed.

Dr. Andrews.—I have one of these little copper gas-stoves, and just at the foot of my chair I place it in cold days, to warm the feet. I find it very comfortable and very fine. It not only warms the patient's feet, but it dries the clothing.

On motion of Dr. Smith, a vote of thanks was extended to Dr. Decker for his very scientific paper.

CHARLES H. TAFT, D.M.D.,
Editor American Academy of Dental Science.

Editorial.

AN ADVANCE MOVEMENT.

It will be observed by the title-page of this month's JOURNAL that the INTERNATIONAL has taken a new step forward in its work by associating with it several collaborators to prepare useful and interesting matter for its pages.

A new department is organized, to be devoted to reviews of important papers appearing in the dental journals here and abroad. These reviews are expected to present the advancement of dentistry to the readers of the INTERNATIONAL in order to elucidate the views of the leading writers in a synoptical manner without carrying over their language,—to be, in other words, such a presenta-

tion as is made in a bibliographical review, by stating in a compendious way the salient features of the subject under treatment. After the analysis is made the application of general principles may be given to exhibit the value of the article.

The intention is to include in these reviews not only the valuable papers in the English language, but those in the German and the French. The matter for this department will be prepared by Dr. Briggs and Dr. Potter, who are by education and training well qualified. The effect of this effort will be to give the JOURNAL more fully an international character by making its pages the repository of the better views of the world upon dental subjects.

To Dr. McClain will be assigned the preparation of miscellanea. His endeavors will be to seek useful information from various sources, principally from dental literature, as may be serviceable, more particularly to that large class of our profession whose habits of work are forming and who look for practical methods to enlighten the difficulties that arise in practice.

The underlying end in the production of the INTERNATIONAL is that the dental profession may have a journal conducted under its own auspices, but this craving to satisfy a feeling of self-respect would be of little value unless at the same time every effort were made to furnish not only most ably written papers bearing on dental science, but those of a helpful character. The editor and the managers of the JOURNAL will endeavor to induce the preparation for its pages of short articles upon practical subjects. We appeal to the society members this magazine represents, and its readers, to contribute this character of matter for publication by us.

The INTERNATIONAL has become an important factor in dental affairs, and appeals to all interested in dental progress to assist in the labor which should be considered a duty common to us all,—managers, society members, readers, and the profession generally.

INTERNATIONAL DENTAL PUBLISHING COMPANY.

THE ESSENTIALS IN TEACHING.

IN another part of this number will be found an interesting and timely article on "Original Investigation not a Necessary Quality of the Teacher."

This statement and the arguments brought to bear to enforce

them will necessarily arouse a wide diversity of opinion. The question, however, is one of serious importance to all teaching bodies, the students directly interested, and indirectly also to the general public.

Without attempting to follow the line of thought adopted by our much-esteemed correspondent, the writer will consider the question from the practical stand-point of experience.

Teaching is recognized to be the power to draw out the best there is in the pupil; in other words, to educate to a position approximating the standard held by the teacher. To accomplish this properly means a quality of mind not generally possessed,—that of descending to the plane of intellect of the student and, for the time being, occupying his position, thinking his thoughts, and combating the difficulties presenting to his mind. Then, having thus, as it were, transformed himself from the superior to the inferior, he will naturally voice his instruction in a language comprehensible to the receiving mind. This would seem to be the foundation upon which to build for future service, and this once established, other things can be added.

The next most important qualification is that the teacher should be a thorough master of his subject. It does not follow that this will qualify a person to teach, but success can never result from imperfect knowledge.

While it is not absolutely essential that a teacher should be an original investigator upon professional topics, he will proportionately fall far below a high standard if he depends entirely upon the work of others. It is equally true that the investigator, the laboratory worker, who depends upon that alone, may fail, and generally does fail, in his efforts to impart knowledge. If the teacher be a lecturer, he must have so mastered his subject that he will cease to depend upon his notes or his manuscript.

Considering seriatim the points named, the writer would first hold the mastery of the subject to be taught as the prime essential qualification of the teacher, but it is a well-known fact that many have been chosen for positions in professional and other schools largely upon the fact that they have proved themselves masters in special branches, and it was taken for granted that this profound knowledge or manipulative skill not only justified the selection, but insured thorough teaching. The examples, abounding everywhere, of failures in this class prove quite conclusively that peda-

gogical excellence is not dependent upon the exact knowledge or skill acquired by the individual.

There is, probably, no problem more difficult of solution than the selection of proper teachers. It is an ever-present question in all schools, colleges, and universities, and is more and more giving managers of dental colleges grave anxiety. The present curricula demand an altogether different class of teachers from those of the past. Are these being developed? Men are not difficult to find who are skilled in the several practical branches; indeed, in some instances they may be superior to the average expert, but are utterly incapable of imparting the knowledge and skill they possess. So exceedingly rare is it to find combined skill and power to impart, that dental colleges, as well as all institutions of learning, are searching the country over to find those possessing the qualities demanded. Failure to find this class of mind forces a dependence upon an inferior article, to the injury of the product.

The time has not arrived in any dental school when pedagogical instruction can be added to the curriculum of the senior year, but some training of how to teach is especially desirable at the present time. The young men go out into the world with very crude ideas in this direction, and, possibly, in a very short time are filling professional positions with very little conception either of the responsibility or of what is required of one occupying the position of a teacher.

The question largely dwelt upon by our correspondent, whether original investigation helps or hinders the teacher, is one not easily answered. Some minds are capable of so thoroughly absorbing the facts obtained by others and making them their own, that they seem able to readily transfer this knowledge to others. Memory plays here an important part. The man who can read a book and store the facts therein contained away for future reference has a power possessed but by the few, and as he gives out this second-hand knowledge he will, in all probability, astound his hearers with his profundity. Is this teaching? To the writer it corresponds to the auction sale of long-used furniture, the life and beauty has measurably departed.

When ability to experiment in the laboratory is combined with a faculty of analysis to deduce results from the facts obtained, and to be able from time to time to repeat the investigations of others, and at the same time, in simple language, to be able to

impart this knowledge, it gives to the instruction a life and power not to be obtained by mere memorizing of facts from books. So impressed has the writer been with the truth of this in his own experience, that he invariably feels a deficiency where it has been impossible for him to duplicate statements made upon laboratory investigation. There is that unexplainable something underlying the teaching that leads him to feel that the only true foundation for all teaching is to first do the work and then to endeavor to discover the best way to impart the knowledge obtained. It is recognized that in many instances this is impossible, and the teacher will be obliged to render a doubtful service to that extent; but while this is true, it does not follow that original investigation is not a necessary quality of the teacher.

The societies that have sprung up in our colleges of recent years have done an excellent work in training the members to an increased ability in extemporaneous speaking. This is one of the essentials of good teaching, and every encouragement should be extended for further progress in this direction. The dental education of the future will depend on these young men, and if they are able to impart the knowledge possessed without extended resort to written lectures, it will be one step, and an important one, gained in ability to instruct. There is no method quite equal to reading from a manuscript to destroy all true teaching. The monotony of a poorly read lecture becomes unbearable, and the tired brain of the student refuses to absorb the matter presented. Cooking undoubtedly spoils much of our physical food, and the method of preparation of many lectures results in mental indigestion to the hearers. The excuse will be made that all are not capable of extemporaneous discourses. This is probably true of nearly all novices in teaching, but it is not difficult to combine the two, written and extemporaneous teaching. It is a great relief to the student to have the teacher leave his manuscript and speak for a few minutes, by way of explanation, on some important topic. He will notice at once the sudden stirring of the class from apathy to interest.

The importance of this whole question felt by all teachers in dentistry is not confined to their work. It is one that possesses paramount importance in the minds of all classes of instructors, and the same difficulties are met with elsewhere as are found in professional work. Means are furnished for pedagogical instruction in the schools, but these are not yet attainable by professional

teachers, and we will doubtless go on in the old crude way for an indefinite period, taking the man and placing him at the head simply because he is a good operator, a generally good prosthetic worker, or a specialist in one of the several branches of medical practice. When an individual can prove that he can make of the raw student material, a good operator, a good mechanician, a good anatomist, he has proved his fitness for the position of teacher in these several branches.

The true teacher, therefore, in the opinion of the writer, combines not memory alone, or power to marshal in order the work of others, but mingling this with analytical reasoning and ability to seek truth from original sources, he will be able to lucidly clear up the most abstruse problems to the slowest mind in his class. This should be the ideal attainment of all who aim to impart the accumulated wisdom belonging to their profession.

The foregoing is confined mainly to didactic teaching, but applies with equal force to direct individual teaching. The didactic method has been tried for generations in all professional schools, and has been found so defective that in medicine and dentistry individual teaching is more and more taking its place. The old, doubtless, will be continued to elucidate principles, but beyond that it has lost vitality as a factor in presenting the practical side of professional work.

DENTAL SURGEONS IN THE ARMY.

ATTENTION is called to the portion, upon another page, of the new Army Bill relating to dentists in the army, and to the names of the gentlemen appointed to conduct the examinations. Comment at this stage would be injudicious, but a very large interrogation mark may be necessary in the future. At present it is the duty of all interested to give earnest support to this initial movement for the improvement of the condition of officers and men in the service.

The three men appointed have a serious responsibility, and they will be held to a strict accountability by the dental profession.

DEATHS IN ENGLAND UNDER ANÆSTHETICS.

THE number of deaths reported recently in the English journals during the administration of anæsthetics, and especially nitrous oxide, has created attention not unmingled with astonishment upon this side of the water.

The rarity of this in America, either in medical or dental practice, leads to the conclusion that there must be something wrong in the training of those who assume to give anæsthetics.

The latest, which is given upon another page under the heading, "Death under Nitrous Oxide," might better have been called criminal negligence. The fact that the patient died from a sponge used to absorb blood and allowed to remain in the mouth and drawn in "and firmly impacted in the air-passages" is almost beyond credence.

It was certainly kind in the coroner to express sympathy with the operator, but the jury's verdict of "death by misadventure" rather exceeds anything in the form of coroners' verdicts that has been noticed in the literature of coroners' inquests.

That accidents may happen in the administration of anæsthetics is too well known to need comment, but the case in question does not seem to belong to this category.

It is true that daily and hourly association with agents and appliances, more or less dangerous, causes a feeling of indifference, and the wonder is that accidents of a serious nature are not more common in practice. It is probable that few take any special precautions in the use of clamps, yet the possibility of the clamp breaking under undue strain or molecular change through constant use seems to be unnoticed. In the writer's experience this has occurred several times, and but for precautionary measures might have resulted seriously to the patient.

Teeth slipping through the beaks of the forceps have caused serious results. This can scarcely be claimed as one of the avoidable accidents, but it should be guarded against by careful examination of the beaks of the forceps that they are not worn smooth by constant use.

Carelessness in the use of escharotics has resulted in serious lesions, which, while not endangering life, have not infrequently produced sloughing and painful injuries to patients.

The number of these results of careless operations have multi-

plied in proportion to the increase of powerful therapeutic agents and appliances to be used in the oral cavity, and the question must be seriously asked, Are we taking all possible precautions to prevent injury to those coming under our care?

Bibliography.

DENTAL ANATOMY NOTE-BOOK. For use in conjunction with Tomes's Dental Anatomy, the South Kensington Museum, and Personal Instruction. By Douglas Gabell, M.R.C.S., L.R.C.P., L.D.S. Claudius Ash & Sons, Limited, London, 1900.

This is a somewhat peculiar size note-book for students, being eleven by six inches. The author says of it, "In spite of complaints as to its unwieldiness, I have kept to the original size, because I wish the book to remain essentially a 'Note-Book,' the blank pages and the spaces in the text being left for diagrams and notes to be made by the student when reading up the subject of dental anatomy or being coached." The size of the book seems to the writer a special advantage, being convenient for memoranda.

This book is not of similar character to the note-books so common in American medical and dental colleges, for these are ordinarily imperfect synopses of the lectures, but is really a guide to the student, enabling him to select the salient points in any given subject, thus saving a waste of time in wandering through a maze of technicalities and verbose phraseology.

It is presumed that the subject-matter is mainly based upon the methods of teaching peculiar to the English dental curricula. More attention is there paid to comparative anatomy than in American dental colleges, and hence very much of this book would not be available to the American student under present arrangement of courses. This guide would seem, therefore, to be best adapted to the course of study in English schools.

"The first part is practically Tomes's Dental Anatomy condensed, the second is intended as a guide to the study of cases in the Central Hall of the South Kensington Museum, and the third is compiled from various sources."

X-LIGHT APPARATUS. For Physicians in the Country and Others.
By William Rollins. Read before the Röntgen Society of
the United States, December, 1900.

This valuable monograph deserves a more permanent setting than the author has given it. It is upon a subject but little understood, but one that interests, or should interest, dentists even more than physicians, for intelligent dentists are beginning to understand that the X-ray is an important adjunct in all serious regulating cases, and that without it the position of impacted teeth is practically impossible to determine.

The readers of the *INTERNATIONAL DENTAL JOURNAL* need not to be informed of Dr. Rollins's work in this and other lines of investigation. The pages of this journal have repeatedly given evidence of his original powers in this direction, as well as the introduction of many valuable appliances.

The work is profusely illustrated by very perfectly prepared engravings. These are necessary to explain the text, and even with them the novice may find it difficult to understand all the details of machinery requisite to produce the results. Dr. Rollins has aimed to produce these in the simplest manner consistent with commercial demands and a minimum amount of study from those for whom they are intended.

It is impossible to give all the author's methods used to overcome difficulties, but the following quotation will give his ideas suited for cities where the street current is available.

"The time will come when every physician will use X-light in diagnosis and treatment. At present the number employing it is very limited. One reason is the defective character of most of the apparatus commercially obtainable.

"In cities where the street current is available, it is practical to obtain from several firms coils and static machines to order, which by suitable changes can be made useful. What some of these changes are will be mentioned later. For physicians in the country, remote from electricity or water-power, the problem is a difficult one. This problem I have attempted to solve in several ways. . . . The cheapest arrangement consists of a twelve-inch Ritchie coil. . . . The coil is excited from four storage cells, which are kept constantly charged by twenty-four gravity cells. The apparatus furnishes enough current to light an X-light tube for an hour a day, using forty-three watts in the primary and

employing the hammer break usually furnished with the coil. Of course, great attention must be paid to having the resistance of the tube such that this small amount of energy will be expended with the least waste. The plant requires no care except to renew the gravity cells at the end of from three to six months, according to the amount of time the light is used. The whole apparatus is enclosed in a case about the height and length of an ordinary book-case, the coil being on top. I used an apparatus of this kind for several weeks to test its value."

In the country where electricity or water are not available for power, "The gasoline engine rated at one horse-power by the makers develops sufficient power to run the static machine three hundred revolutions for one hour on a quart of gasoline."

It is impossible to follow the author through his thorough and generally technical explanation of his various efforts to perfect and simplify the machines, but that he has added materially to the means that will tend to make the use of the X-ray more general must be conceded, and could this be presented in book form it would be of value to those contemplating efforts in this direction. It seems to the writer that all dental colleges should not consider the list of apparatus complete without an X-ray machine. The necessity for this is more and more apparent through the multiplication of difficult cases constantly presenting in the clinics.

Obituary.

DR. HENRY GERHART.

DR. GERHART died at his home in Lewisburg, Pa., on Sunday, January 20, 1901.

This simple announcement means more than that of the death of ordinary men, for Dr. Gerhart belonged to a class of which, unfortunately, there are too few, a class whose lives have broadened existence and made, unselfishly, paths for others to follow.

Dr. Gerhart was born at Mill Creek, Lancaster County, Pa., on April 8, 1827. He subsequently moved to Philadelphia and

received his final school training in the High School of that city. After graduation his tastes led him into mechanics, and he entered the machine works at Eden, near Lancaster, Pa. At a later period he took up the study of dentistry and settled at Lewisburg in 1851, residing there to the date of his death.

Dr. Gerhart's work in dentistry in the State of Pennsylvania has been a most important one, but, like the influence of all earnest men, was felt in an ever-widening territory up to the period of his final departure from earthly labors, for at no time did he cease in his efforts for a higher standard of professional excellence.

He was one of the active organizers of the State Dental Society, and the first acquaintance the writer had with him was at the preliminary meeting that led up to this organization.

His intellectual force naturally made him a leader in whatever position he felt called upon to fill, and he was a frequent contributor of valuable papers to the literature of his profession. He was president of the State Society for several terms.

When the present law creating an examining board in dentistry went into effect he was appointed by Governor Hastings as one of its members, and was reappointed to that position by Governor Stone. It was through his high character, and that of the majority of the board, that helped materially to moderate the opposition felt by many to the re-examination of graduates.

The pastor of the Baptist church with which he had been connected for forty-eight years thus epitomized his deep reverential character for truth. "His admiration for the perfect character of Jesus and his matchless teachings was unbounded. In many things he agreed with the most pronounced type of advanced thinkers; in his search for truth he was a higher critic; in his philosophy of life he was an evolutionist, after the school of Charles Darwin; upon many subjects he was an agnostic; subjects upon which other men dogmatize with the easy egotism of ignorance were to him profound, unfathomed mysteries. . . . One doctrine he knew to be true,—the doctrine of God's infinite love."

Dr. Gerhart was active in educational matters. He became one of the trustees of Bucknell University in 1860, and served in that capacity for twenty-one years. The president of that University, in his remarks, said of him, "It was not in his official capacity that Dr. Gerhart most powerfully influenced the life of the various

schools. It was by the power of his personality. His was a well-stored mind. His reading was wide and varied. His observation of men and things had been keen and extensive, and he was ready in the use of his varied fund of information. What he had read and observed he had made his own by reflection."

To satisfy this craving for knowledge of men and things he made extensive travels in Europe, the Holy Land, and Mexico; but it is said of him that he found so much of ignorance, greed, and bigotry wherever he went, that his travels were in the main disappointing.

He possessed great facility in the acquisition of languages, and made several of the modern languages equally his own.

When Dr. Gerhart died education lost a true friend and an enthusiastic devotee. Dentistry has reason to feel grateful that such a character was part of it through so many of the developing years of the nineteenth century, and that his splendid example is left us that we too may continue laboring for the high ideals that were the overmastering influence governing his life, and may so live and work that the future of our profession may be worthy of this man and of his highest conceptions.

Dr. Gerhart married Miss Susan Kennedy in 1851. His eldest son, Wilfred Gerhart, M.D., died in 1890. The other children were present at the funeral,—May, the wife of Rev. Joseph E. Perry, of Boston; Elizabeth, the wife of Mr. Edgar Dudley Faries, of Philadelphia; Mr. Rolf Gerhart, of Virginia, and Dr. Weber L. Gerhart, of Lewisburg.

Domestic Correspondence.

REPLY TO THE "ITEMS OF INTEREST."

TO THE EDITOR:

SIR,—I must ask for limited space in your valuable journal to reply to a few points in Dr. Ottolengui's editorial reply to criticism, in the January issue of *Items of Interest*. It is with reluctance that I say anything more on the subject in question, and would prefer to remain silent, but Dr. Ottolengui in his reply says.

"Dr. Arrington entirely failed to interpret quotation, and with misinterpretation has erected an edifice full of evil."

With due respect for the doctor's view of the interpretation, I must say I interpreted the language in "Snap-Shots" which I criticised just as a large majority of fair-minded men would feel authorized to interpret, and possibly would interpret, and there was no error in regard to it. The quotation is correct, and the language is plain English and speaks for itself. There is no dodging the meaning of this language. It will admit of but one legitimate construction (interpretation), that which I gave it. This, I am sure, would be the candid opinion of all unprejudiced men in the dental profession familiar with the English language.

In writing the criticism, "What does it mean?" it was foreign to my intention to "erect an edifice full of evil," and I must say, in all frankness, if there is any such structure reared, the editor of the *Items of Interest* is the inventor and builder, and to him, single-handed, shall all the honor be accorded. He says, "The language of Dr. Arrington is neither logical nor intelligent." By his measurement, in his effort to work out of a hole, it possibly to him is so, but it was plain English frankly expressed, and conveyed a fact easily comprehended.

At the close of the last paragraph of the editor's reply he says, "They will not hesitate to act, even though some may have accused them of being hirelings with a fixed price." This is an unjust and unauthorized accusation, and has no foundation in truth to sustain it. My language used in the criticism will not admit of any such construction, unless twisted, turned, and stretched for an object. I said, "No Southern man, a member of the Southern Dental Association, unless a hireling with a fixed price (there may be such, but I am unwilling to believe it), will ever offer such an amendment under existing circumstances." Some may ask, What were the circumstances to which allusion was made? The circumstances were these: there was an arrangement and agreement for consolidation entered into at Old Point Comfort in 1897 which had not been complied with as was stipulated, except on the part of the Southern. Then, in August, 1900, in the *Items of Interest*, under the heading "Snap-Shots at the National Association," the author, R. O.,—presumably Dr. R. Ottolengui,—had the effrontery (that is what it was) to proclaim that "the idea of having subdivisions of the Association, to be known as Eastern,

Western, and Southern branches, it is well known now, was placed in the constitution as a means of inducing the Southern men to agree to union."

My language was too plain not to be understood, and should not be misconstrued to create mischief.

I make no retractions, nor do I offer any apology for language used, for I felt at the time of writing, and do now, that the circumstances stated justified the language. All I ask is that the *circumstances* be rightly considered and the language rightly interpreted.

Dr. Ottolengui, in an effort to strengthen his position, refers to and quotes his editorial in *Items of Interest*, 1897, page 800, for his ideas of what occurred at Old Point Comfort, when the occurrences were quite fresh in his memory. He says, "Before the meeting at Old Point Comfort the question of union of the Southern and American into a National Dental Society was discussed, and it was suggested that there might be tributaries in the East, South, and West. This is the plan which was submitted by the committee and was finally adopted. It seemed wise when offered, because of the fact that the love which the Southern men have for their society was such that the committee and others felt assured that any plan which would disband the Southern would fail, and that on such terms union could not be effected." And then says, "But immediately after the adoption of the committee's constitution and by-laws, union being an accomplished fact, it became evident to all who analyzed the situation that the machinery of management for the new National body was cumbersome, and if not radically altered ultimate failure must ensue." Worse and worse, but in close accord with the "*Snap-Shot*" blunder. The word *immediately* is expressive, but unwisely uttered. The question very naturally arises, Why did it so suddenly become evident *after the union was an accomplished fact*, "that the machinery of the management of the new National body was cumbersome, and that if not radically altered ultimate failure must ensue"? "Immediately," he says. That is a word that cannot be misconstrued. Everybody knows what the word *immediately* means. There is no twisting it for effect. The immediate evidence and the evident foreknowledge of results was a feature of wisdom somewhat surprising and unlooked for. Generally, foreknowledge is helpful and works advantageously, but in this instance it has evidenced

somewhat a feature of bad faith and has worked badly, as might have been anticipated. The doctor has evidently gotten into a pretty deep hole, and there must stay until he learns to be more cautious in writing up proceedings of the National Association and ceases taking such *immediate* recognition of possible consequences.

B. F. ARRINGTON.

GOLDSBORO, N. C.

Foreign Correspondence.

REPORT OF THE FOREIGN RELATIONS COMMITTEE.

TO THE EDITOR:

DEAR SIR,—In the report found on page 678 of your journal for October, 1900, some passages occur relating to Germany which might be subject to misinterpretation, and I therefore beg you to give the following a place in your esteemed journal. The report says, "The clinical instruction is largely devoted to extraction and oral surgery. The practical work is usually quite limited."

It is quite true that more time is devoted to the extraction of teeth than in American colleges, if I am properly informed. It is a mistake, however, to infer from this that the other work is neglected on that account. The students at the University of Berlin take from one to two terms in extracting, and from two to three in the conservative treatment of the teeth, and a proportionate time in mechanical dentistry. The statement that the practical work is usually quite limited might have been true twenty years ago, and may be true now of a few schools, but in all the better German dental colleges at the present time the amount of time spent in practical work will be found to make a fair approach to that spent in the average American dental schools, although the need of a longer term of study is here severely felt, and it is to be hoped that ere long an extra year will be added.

The report states further that "The examinations have very little resemblance to ours, each teacher asking three questions out of a list of forty approved by government. They are not usually as exhaustive or comprehensive or scrutinizing as ours." This

statement scarcely gives an adequate conception of the way in which examinations are here conducted. The examinations, which must be passed before a *State board of examiners*, are divided into four parts:

I. *Special Surgery*.—The candidate must examine a patient in the presence of the examiner, give the diagnosis, prognosis, and treatment of the case, and write a short thesis on it, which must be delivered to the examiner the next morning.

II. The second part of the examination is divided into three subjects:

1. Anatomy and Physiology.
2. General Pathology, Therapeutics, Materia Medica, and Toxicology.
3. Oral Surgery, Pathology, and Therapeutics.

In each of these three subjects the student must answer, in writing, two questions, which he draws out of a receptacle in which there are fifty questions.

III. *Practical Dentistry*.—In the third part of the examination the student has to show his practical ability in the operative and mechanical branches of dentistry.

1. In the operative department he must demonstrate the manipulation of the different dental instruments upon a patient, insert at least two fillings, one of which must be gold, treat a root-canal, extract two teeth, and clean the teeth of one patient,—all in the presence of the examiner.

2. In the mechanical department he must make and fit in the mouth of a patient at least one artificial denture or a regulating apparatus. The examiners may extend the practical examinations *ad libitum*.

IV. The fourth part of the examination is oral, held before three examiners, one of whom must be a graduated German dentist (*Zahnarzt*). The subjects in particular are Anatomy, Physiology, Pathology (general and special), and Materia Medica. But questions may be asked on any subject which comes within the range of dental science.

When the candidate passes these examinations successfully, he receives his diploma, not from the dental school or university, but from the Ministry of Education, which entitles him to practise as "*Zahnarzt*" in Germany.

We recognize the fact that dentistry has been making rapid

strides in America during the last few years, and we rejoice over it, but at the same time we have not been quite inactive here; and I am not sure but that the *progress* made in Germany during the last ten years might compare not unfavorably with that made in America during the same period. What we here most lack, and what we hope to obtain in course of time, is the splendid equipment of the better American schools.

Very sincerely yours,

W. D. MILLER.

[The foregoing from Professor Miller was referred to Dr. W. C. Barrett, Chairman of the Foreign Relations Committee, and the following reply was sent by him for publication.—ED.]

That to which Professor Miller refers in his communication is the last annual report of the Foreign Relations Committee of the National Association of Dental Faculties. Some time before that report was made Professor Miller, as the Chairman of the Advisory Board for Germany, had sent an account of the methods pursued in the examinations of the University of Berlin, with a summary of the instruction given in the Dental Department. This being but one of the very many communications received from foreign countries about that time, it was unfortunately mislaid and lost, nor has it yet been found. When, therefore, just in time for use, another statement was sent in by some one in whose knowledge and candor the committee had confidence, it was substituted for the official one. It did not pretend to do more than attempt to give a summary of the practical results and workings of the examinations, but to the impartiality of the writer the committee believes it can confidently bear witness. The members deeply regret if any injustice has been done, as they have tried very hard to be at all times and in all things fair and free from prejudice. The blame, if any there is, rests wholly with the Chairman, who is custodian of the records.

W. C. BARRETT,

Chairman Foreign Relations Committee.

Current News.

TRI-STATE DENTAL MEETING—A LEGAL NOTICE.

Know all men by these presents that on the fourth, fifth, and sixth days of the sixth month, in the year one thousand nine hundred and some, Annie Dominoes, in the City of Indianapolis, State of Felicity, otherwise known as Indiana, with the Banks of the Wabash not far away, and several other banks a good deal closer, there will be held, convened, and, as you might say, congregated, a galaxy, or assemblage of practising dentists, for the purpose of meeting, getting together, and associating themselves in conclave, to hear papers and discussions, see clinics and exhibits, and otherwise inform, enlighten, refresh, and amuse themselves, in a just and lawful manner, according to that clause in the Constitution of the United States which insures every citizen of this republic protection in the pursuit of happiness.

And know all you same men, by these further Christmas presents, that this is the third, tertiary, or ternary, joint or amalgamated meeting of the State Societies of Ohio, Michigan, and Indiana, which said joint meetings take place or occur every third year, beginning at the commencement, and may be called triennial in their being as well as triangulate. And, therefore, as the first of these meetings, held at Detroit in 1895, was, is, and will be known as the O! I'm meeting, and the second, held at Put-in-Bay, in 1898, was raised and called the Mi, O! meeting, be it hereby and hereon ordained, specified, ordered, and otherwise understood that this coming Tri-State Dental Meeting of the State Societies of Ohio, Michigan, and Indiana, to be held at Indianapolis, Ind., June 4, 5, and 6, 1901, shall be known officially as the O, Mi! meeting.

You are all invited to come and break bread with us.

If there is any further information desired that is not imparted in the above, it may be accumulated by communicating with

GEO. E. HUNT,
Chairman.

INDIANAPOLIS, IND.

DENTAL SURGEONS IN THE ARMY.

THE following is part of Section 18 of the new Army Law, approved February 2, 1901, and relating especially to the employment of dentists in the army as "contract dental surgeons:"

"That the Surgeon-General of the Army, with the approval of the Secretary of War, be, and he is hereby, authorized to employ and appoint dental surgeons to serve the officers and enlisted men of the Regular and Volunteer Army in the proportion of one dental surgeon to every one thousand of said Army, and not exceeding thirty in all. Said dental surgeons shall be employed as contract dental surgeons, under the terms and conditions applicable to army contract surgeons, and shall be graduates of standard medical or dental colleges, trained in the several branches of dentistry, of good moral and professional character, and shall pass a satisfactory professional examination: *Provided*, That three of the number of dental surgeons to be employed shall be first appointed by the Surgeon-General, with the approval of the Secretary of War, with reference to their fitness for assignment, under the direction of the Surgeon-General, to the special service of conducting the examinations and supervising the operations of the others, and for such special service an extra compensation of sixty dollars a month shall be allowed: *Provided further*, That dental college graduates now employed in the Hospital Corps, who have been detailed for a period of not less than twelve months to render dental service to the Army and who are shown by the reports of their superior officers to have rendered such service satisfactorily, may be appointed contract dental surgeons without examination."

The examiners appointed are J. S. Marshall, M.D., Chicago, Ill.; R. T. Oliver, D.D.S., Indianapolis, Ind.; and R. W. Morgan, D.D.S., Lynchburg, Va.

NEW YORK STATE DENTAL SOCIETY.

THE annual meeting of the New York State Dental Society will be held on Wednesday and Thursday, May 8 and 9, in the assembly hall at Hotel Ten Eyck, Albany, N. Y.

The following essayists will present papers upon subjects to be announced: G. V. I. Brown, M.D., D.D.S., Wisconsin; E. S.

Talbot, M.D., D.D.S., Chicago, Ill.; W. E. Griswold, M.D., D.D.S., Denver, Col.; W. A. Purrington, LL.D., New York; H. D. Hatch, D.D.S., New York; A. R. Cooke, D.D.S., Syracuse, N. Y.

Members of the profession are cordially invited to be present. Head-quarters, Hotel Ten Eyck. Special rates, \$3.50 per day.

DR. W. A. WHITE,

Secretary.

HARVARD ODONTOLOGICAL SOCIETY.

At the annual election of the Harvard Odontological Society, at Boston, January 31, 1901, the following officers were elected for the ensuing year:

President, Joseph Totten Paul, D.M.D.; Recording Secretary, Robert Tucker Moffatt, D.M.D.; Corresponding Secretary, Arthur Henry Stoddard, D.M.D.; Treasurer, Lyman F. Bigelow, D.M.D.; Editor, Harry W. Haley, D.M.D.

Executive Committee.—Dr. Robert T. Moffatt, Chairman; Dr. William P. Cooke, Dr. Frank T. Taylor.

ROBERT T. MOFFATT,

Corresponding Secretary.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Pittsburg and Philadelphia, May 7 to 10.

Apply to Hon. James W. Latta, Secretary Dental Council, for examination papers and further information.

G. W. KLUMP,

Secretary.

WILLIAMSPORT, PA.

SOUTHERN DENTAL SOCIETY OF NEW JERSEY.

At the annual meeting of the Southern Dental Society of New Jersey, after Dr. C. S. Stockton, of Newark, had read a very interesting paper entitled "Our Calling," the election of officers for the ensuing year took place. The result follows:

Dr. O. E. Peck, of Bridgeton, President; Dr. Charles P. Tuttle, of Camden, Vice-President; Dr. T. V. Smith, Jr., of Camden, Corresponding Secretary; Dr. A. K. Wood, Camden, Recording Secretary; Dr. Mary A. Morrison, Treasurer.

Executive Committee.—Dr. A. Irwin, Chairman; Drs. J. E. Duffield, Camden; J. G. Halsey, E. E. Bower, W. A. Jacquette, and A. B. Dewees, Camden.

A. IRWIN,
Chairman Executive Committee.

JEFFERSON COUNTY DENTAL SOCIETY.

THE sixth annual meeting of the Jefferson County Dental Society was held in Watertown, N. Y., December 10, 1900. It was largely attended by dentists of Central and Northern New York. Drs. F. M. Willis, of Ithaca, Charles H. Barnes, of Syracuse, and I. C. Curtis, of Fulton, N. Y., gave very interesting clinics. These, together with President George B. Parker's address, and papers by Drs. C. W. Howard and G. R. Danforth, of Watertown, made the most successful and instructive meeting in the Society's history.

The election of officers for the ensuing year resulted as follows: President, D. A. Scobie, Ogdensburg; Vice-President, G. R. Danforth, Watertown; Secretary and Treasurer, R. F. Caster, Watertown.

E. E. HARRINGTON,
Secretary.

WATERTOWN, N. Y.

COLORADO STATE DENTAL ASSOCIATION.

THE fifteenth annual meeting of the Colorado State Dental Association will be held in Denver, Tuesday, Wednesday, and Thursday, July 9, 10, and 11, 1901.

H. F. HOFFMAN,
Secretary.

DENVER, COL.

THE International Dental Journal.

VOL. XXII.

APRIL, 1901.

No. 4.

Original Communications.¹

DEVELOPMENT OF THE MAXILLARY SINUS.²

BY EMMA E. MUSSON, M.D., PHILADELPHIA.

ANCIENT historical literature relating to theories advanced on the anatomy and function of the pneumatic sinuses cannot fail but to be interesting to those working in these regions, though, curiously enough, the anatomists of ancient times seemed to have been better acquainted with the frontal and sphenoidal sinuses than with the more conspicuous and easily accessible antral cavities.

Some of the earlier anatomists of the sixteenth and seventeenth centuries proved to their satisfaction that the cavities of the frontal and sphenoidal bones were lined with a green membrane; later the statement was applied to the antrum, and in addition it was announced that these sinuses were filled with a medullary substance; another theorist advanced the idea that the function of this so-called medullary substance was to supply nutrition to the surrounding bones and to the teeth of the superior maxilla.

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the Academy of Stomatology, Philadelphia, January 22, 1901.

Later authors combated the theory of the sinuses being filled with a medullary substance and contended that they were filled sometimes with mucus and sometimes with air, and a few were inclined to think that these spaces were an outlet for the fluids of the brain. Among a few authors who at this time advanced the theory that the sinuses were filled with air, or, in other words, were empty, was N. Highmore, after whom the antrum of the superior maxilla is named, who in a disquisition, written in 1681, combated the older theories.

In spite of this the anatomists still did not accept the theory of the sinuses as air-spaces, and Vieussens adhered to the old theory that they contained mucus, and that the function of these sinuses was to disembarass the blood of mucus on its upward course to the brain. Anatomists now explain the green membrane by post-mortem changes and the presence of mucus, and a medullary substance by an ante-mortem catarrhal or purulent accumulation in the sinuses.

The theories as to the physiology of the air sinuses are equally interesting; probably the most ingenious was the one that they generated air and expurgated the animal spirits. In 1776 they were considered as necessary to phonation, later still to olfaction, the antrum excepted; though Vesalius had, before 1766, seen in these cavities a formation of bony structure that combined lightness and volume, the theory of the present day.

According to Durcy, the first outlines of the maxillary sinus is represented by a lateral invagination (depression outward) of the nasal mucous membrane, corresponding to an excavation in the rather thick wall of the cartilaginous capsule of the nose. Later this cartilaginous capsule becomes surrounded by bony tissue and, disappearing, the mucous membrane of the sinus is lodged in a bony diverticulum. At four and five months we have the antrum developed as in Figs. 1 and 2.

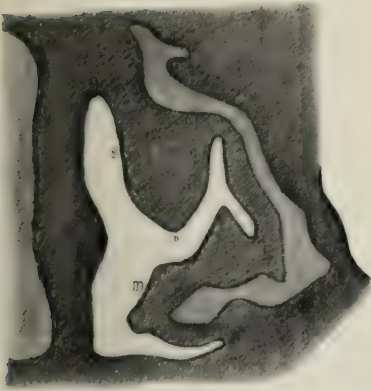
In the new-born the maxillary sinus is a small depression posterior to the lachrymal duct at the level of the second molar (Fig. 3); in the second year the amount of space between the infraorbital canal and the canine milk-tooth is ten millimetres. At eight and nine years of age it has extended up into the zygomatic apophysis, and in its transverse diameter has taken definite shape. With the descent and eruption of the permanent teeth, the depth and the height of the sinus is increased. The

FIG. 2.



S, ethmoidal mass; B, bulba ethmoidalis;
P, unciform process; m, inferior turbinate.

FIG. 1.



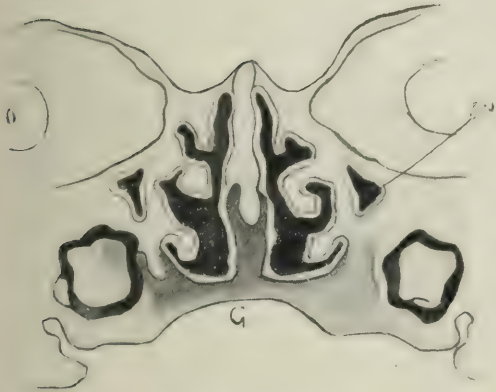
S, ethmoidal mass; P, unciform process;
m, inferior turbinate.

FIG. 4.



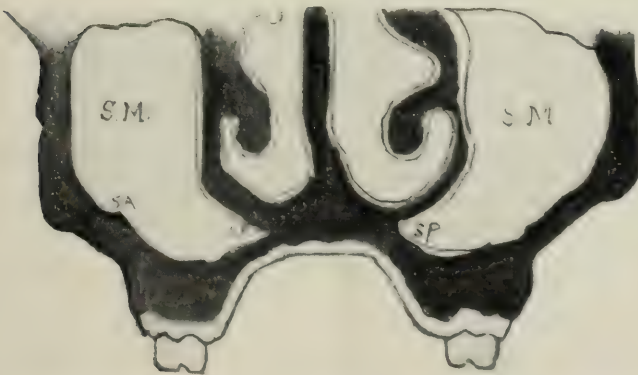
SM, maxillary sinus; SA, alveolar sinus;
PA, alveolar process.

FIG. 3.



SM, maxillary antrum.

FIG. 5.



SM, maxillary sinus; SA, alveolar sinus; SP, palatine sinus.

dimensions are, therefore, never fixed until after the end of the second dentition.

Macrosomatique mammals, those with the sense of smell highly developed, as in dogs, have open maxillary sinuses as seen in the Plate, and form simply a notch which is large posteriorly at the expense of the palatine bone. The orang-outang has one large single cavity formed by the maxillary sinus and ethmoidal cells, this communicating by a large, free opening with the sphenoidal sinus, as seen in the Plate.

There is the greatest variety in the size and shape of the antrum; the process of resorption of the bony tissue may go on to its full extent, leaving a large sinus with thin walls, or the process becomes inhibited with the result of a small sinus with thick, bony walls; or, again, the development of the walls of the antrum is defective. There, however, always seems to be a more or less constant relation between the development of the nasal chambers and that of the antral cavities,—a wide nasal cavity, a narrow antrum, and *vice versa*. Zuckerkandl's table of normal measurements is as follows: Frontal dimensions of air-spaces in the superior maxillary, sixty-eight millimetres; width of the nasal fossa, thirty-one millimetres; height of antrum, twenty-six millimetres. In a case of atrophy of the antrum: dimension of air-space, sixty-nine millimetres; width of the nasal fossa, forty-eight millimetres; height of right antrum, twenty-two millimetres; height of left antrum, eighteen millimetres; a difference of seventeen millimetres in increase of width of the nasal fossa and a corresponding diminution in that of the antral cavity. In taking height of antrum, its nasal wall is considered as the base, the apex being a line running from the zygomatic process to the tuberosity of the superior maxilla.

In the specimen I have here this evening the resorptive process has been complete, leaving thin walls for all its boundaries. There is a prolongation of the sinus up into the infraorbital region, producing an infraorbital fossa, and causing a strongly projecting infraorbital canal; a second and third prolongation extending into the zygomatic and frontal processes of the malar bone; a fourth the result of the almost complete resorption of the alveolar process, the dental alveoli of the first and second molars forming part of the floor of the cavity, the floor being some millimetres below that of the nasal cavity, also seen in Fig. 4. A fifth pro-

longation is the extension of the fossa between the plates of the palatal portion of the superior maxilla, almost as far as the spinous process,—that is, the middle line, also seen in Fig. 5. Thus, the upper wall of the sinus to a large extent forms the floor of the nose. The width of the nasal fossa measures twenty millimetres, the height of the antrum forty-three millimetres, and the depth forty millimetres. Zuckerkandl gives forty-six millimetres as the greatest width of antrum found in his dissections. Such an antrum is to be diagnosed in life in several ways: the narrowness of the nasal chamber or lack of bulging outward of external nasal wall; the lack of depression of the facial wall of the antrum; the bulging outward of the antrum posterior to the zygomatic process; and by the transillumination test, the brilliant illumination of the infraorbital fossæ and the pupils.

Surgically such an antrum can be easily opened at any point the operator should choose to elect, even from the roof of the mouth; also in the radical operation in the canine fossa the surgeon would run no risk of wounding the infraorbital nerve, so great is the height of the sinus from alveolus to the infraorbital canal.

Incomplete resorption, or arrested development, and approximation of the maxillary walls are the chief causes of stenosis of the antrum. To these may be added depression of the canine fossa, thickening of the walls of the antrum, and bulging of the external nasal wall into the antrum.

When there is incomplete resorption of bone, we have, taking the place of the normal fossa, a finely cancellated bone-tissue; this lack of absorption is mainly confined to the alveolar process, in consequence of which the floor of the antrum will be some six to nine millimetres above the floor of the nose, and thus between the roots of the molars and the floor of the antrum there is a thick layer of bone which renders the drilling into the antrum a painful, tedious process; for the same reason, drilling through the inferior meatus would be difficult if not impossible. In such cases the canine fossa would be indicated as the point of entrance.

In approximation of the maxillary walls, examination would demonstrate the depressed facial wall and a bulging outward of the external nasal wall. Depression outward of the nasal wall is almost always at the expense of the antrum, and may take place either at its lower or its upper portion, depending whether the

depression is found in the inferior or middle meatus. This conformation is very readily diagnosed by a nasal examination, which reveals a deeply concave inferior or middle meatus; the latter condition is very well shown in these specimens. The surgical importance of this variety of stenosis would not be the difficulty of penetrating into the antrum, but the danger of going through both walls and into the nasal cavity.

A condition of antrum impossible to foresee is that of its division into two sections by a partition wall. In the plate presented the sections are separated by a vertical division wall, and the sinuses thus formed communicate separately with the middle meatus. (Fig. 4.)

Only in the neighborhood of the maxillary ostium does the mucous membrane resemble the pituitary membrane of the nose; in its greatest extent it is pale and thin, and easily separates into two layers. The superficial layer, the so-called mucous membrane proper, is ciliated, and contains but few glands; the deep layer is adherent to the bone beneath and takes the place of the periosteum. The interval between these layers is occupied by a very loose cellular tissue which contains a large number of glands; this latter becomes markedly swollen and infiltrated in the course of an inflammatory process in the antrum, and the whole mucous membrane, thin and pale as it is, will in the course of a short period become transformed into a thick, fungous tissue, with a tendency to the formation of polypoid growths.

On the anterior and lateral walls of the antrum will be found numerous canals containing the dental nerves and their accompanying blood-vessels; their walls are at many points imperfect, and thus the nerves lie in direct contact with the lining mucous membrane of the antrum and will be subject to all of the inflammatory conditions of this membrane, giving rise to the severe attacks of pain present in acute antral sinusitis.

IMPRESSIONS OF THE INTERNATIONAL DENTAL CONGRESS.¹

BY DR. E. A. BOGUE, NEW YORK.

A COUNTRY deacon was once called to report upon a site for a graveyard, and he reported that the place selected was so mean that he would never allow himself to be buried there if he lived until he died. You see, this man was called upon to make a report after the work was all done. That is my fix. I promised the chairman to tell a story, and I am now telling one, but I fear I shall have to begin in the middle and leave off at both ends.

And now, to come to the Dental Congress. The management of the preliminaries was most admirable. It may not be known to any of the gentlemen here present that there is one source of ambition to every living Frenchman, and that is to obtain the ribbon of the Legion of Honor. He crawls for it as soon as he gets out of his cradle, and he keeps after it until he gets it or dies a disappointed man. M. Godon was the President of the International Dental Congress, and he, with his secretary, M. Sauvez, worked unceasingly and with success. They so far thought out all the contingencies that might arise that it would be difficult to find anything that they had not thought of and provided for so far as their facilities allowed. Needless to say, M. Godon got his Legion of Honor, and the last time I saw him he had it set in diamonds blazing on the lapel of his coat.

The first meeting of the Congress was held in the building on the exposition grounds devoted to congresses, and of which there were a great many all the way along. There were about twelve hundred names enrolled on the list of membership, and at the first meeting there were probably gathered eight or nine hundred of this number. The subsequent meetings were held in the Hotel of the Scientific Societies, where all the ten sections could meet at the same time and in separate rooms while a general meeting with stereopticon views could be simultaneously run on the ground-floor. The official language, of course, was French, but papers were also read in Italian, German, and English. Difficulties were encoun-

¹ Read before The New York Institute of Stomatology, January 4, 1901.

tered by many of the gentlemen present in struggling with these various languages.

Every evening, and generally at noon, entertainments were given either by the committee having the Congress in charge, by the visiting societies or local societies, or by individuals. These entertainments consisted of concerts in the evening, stereopticon exhibitions, dances, and dinners. I had the good fortune to receive an invitation to lunch with about fifty English *confrères*, who received their American brother most cordially. On another occasion Dr. Brophy, Dr. Kirk, Dr. Harlan, and myself were invited to meet a number of English visitors at a dinner at the house of Dr. Burt, himself an Englishman, practising in Paris, whom many of you will remember having been present twelve years ago at the Odontological dinner at the Brunswick. Dr. Burt's dinner was followed by a concert, recitations, etc., and the whole affair was most charming, and illustrative of the kindly feeling that existed regardless of national lines.

A few members of the Dental Congress were invited to a reception tendered to the members of the Medical Congress by President Loubet at the Elysée. I may perhaps be pardoned if I give you a little description of that reception. It does not differ very much, I suppose, from other republican functions, and as none of the gentlemen here present will be able to contradict me, I suppose I can tell such a story as I please. The Elysée palace is the official residence of the French president, as it also was of the last French king. It is a low building with high rooms and very large ones; with several flights of stairs and very big ones. We were ushered past the military guard at the gate, across a court-yard, and half-way up a flight of stairs to a landing, where our invitation cards were taken and we were turned right and left into coat-rooms to dispense with our superfluous belongings, receiving checks instead; then up the rest of the flight of stairs from the landing to the top, where our names were asked or our cards taken and we were introduced into the reception-room, where stood the president and his wife to receive their visitors. I may as well say right here that the Shah of Persia and myself were both moved to pay our respects to the President of France on the same day. The president's officers and attendants, both ladies and gentlemen, were arranged in a sort of semicircle fifteen or twenty feet behind the president and his wife. None of the invited guests remained in this room, but passed

on, most of them into the garden and a few of them into other reception-rooms in the building especially arranged for receiving large numbers of people. The garden is about six hundred feet long by two hundred and fifty or three hundred feet wide, surrounded by a brick wall, inside of which is a thick row of trees which completely line the enclosure, and at the corners there is enough shrubbery to form an oval. The centre of this oval was depressed perhaps ten or twelve feet, and from that centre, on every side, extending to the wall was the most beautiful turf, carefully trimmed, and free from all other vegetation; not a weed could I find. The whole centre being clear, a carpet fifteen or twenty feet wide was laid from the palace to the farther end of the garden, where a stage had been erected after the manner of a large theatre, and in front of it there were about two thousand chairs. We had hardly taken our places when the president and his wife and the household, together with the Shah of Persia and his retinue, came down this carpet and took their places in front of this stage. Shortly afterwards the curtain went up on an exhibition of the various dances from the most ancient times up to the latest French craze, under the direction of the ballet-master of the Grand Opera. There were four series of ballets, and the whole thing occupied about two hours and a half. And this is the way in which the French president amused and entertained his guests. After this was over they were still further amused by a slight sprinkling of rain, which caused a skurrying among these people very much as it would happen at a country fair under the same conditions. The rush was in the direction of the palace, where the struggling masses, or such of them as could struggle strongly enough, were served with a collation. I mention this simply to show that all the world is kin, and that the same thing happens at a reception in Paris as would happen at a similar function in New York or Washington. It further interested me to see the large rooms especially provided for receptions, the walls of which were decorated with fine paintings, mural and otherwise, but in which rooms almost no furniture at all had been placed. These rooms would perhaps hold a thousand persons each, and there were several of them.

On Sunday all the members of the Congress were invited to St. Germain for breakfast, and two train-loads went out. We sat down to breakfast at about one o'clock, our usual lunch hour, in a

wood attached to a large restaurant and kept for the purpose of providing dinners out of doors and to a large number of people. It was a delightful experience. The members of the Congress and their wives had by this time become more or less acquainted, and the day being so beautiful, they seemed to be in a most perfect condition for enjoying the breakfast under the trees. Tickets were given to each to come back by boat on the Seine, but as the Seine from St. Germain to Paris makes more turns than a double letter S, it takes four hours by boat, so I preferred to come back in another way.

At the Congress it was, of course, impossible to attend more than one of the meetings at a time, although there were ten or eleven going on at once, and hence some of the most valuable contributions escaped me, but the four mentioned on the programme of the evening were those which interested me the most, and it is those which I shall endeavor to briefly describe.

It may be known to you that Dr. Brophy, of Chicago, conceived the idea some twelve or fifteen years ago of operating for cleft palate at the earliest possible stage of infancy. Having done this operation several times, modifications suggested themselves until he reached a point where he earnestly advocated the performance of this operation when the child is but a few days old. It consists in paring the edges of the cleft and putting wire sutures laterally from side to side through the upper maxilla, and then in bending or breaking (at this age fractures probably do not occur) the upper maxilla until the freshened edges are in apposition. The wires on the outside of the gum are passed through pieces of lead and bent over and twisted. The result is that union takes place not only in the soft parts, but in the bony tissue as well, and as time goes on the processes of development seem to throw out these upper maxillæ to almost or quite the dimensions of the normal parts, making it correspond to the lower jaw. Dr. Brophy had several patients at Niagara Falls two or three years ago upon whom he operated when they were infants. I very carefully examined one of them, a girl about twelve years of age, and it was remarkable how nearly the upper jaw corresponded with the lower and how near it was to the normal size. Speech was almost normal; in fact, if one's attention were not called to the fact that it was a case of former cleft palate, it would not have been suspected.

After Dr. Brophy's paper had been read, Professor Gariel, one of the Medical Faculty of Paris, took the floor and acknowledged that, although he was a surgeon, and had operated many times for cleft palate, he had been excessively prejudiced against any method but the one which he had heretofore employed; but that he was quite ready to acknowledge the superiority of Dr. Brophy's method and henceforward to adopt it, especially in view of the facts stated by Dr. Brophy, that out of several hundred cases upon which he had operated, not one had resulted in the death of the patient. Professor Gariel's tribute of respect and admiration to Dr. Brophy was most hearty and very welcome to those who were not only his fellow-countrymen but also fellow-dentists. Professor Gariel's treatment of the whole subject was courteous in the extreme, and his utterances could fairly have been called impassioned, inasmuch as his surgical experience enabled him to accept Dr. Brophy's statements and to adopt his methods. A detailed statement of Dr. Brophy's method of operation will be obtainable by all here present as they read the proceedings of the Congress.

Cognate to this same subject is the method of constructing vela for adult and adolescent cleft palate cases where no operation has been performed. This was brought forward by Mr. E. Lloyd Williams, of London. A model and the apparatus for its construction I have brought with me, and I hope to have the pleasure of demonstrating it to this body at one of its afternoon meetings. Unfortunately, the major part of the apparatus is at this moment at the custom-house, so that we shall have to wait a little. Mr. Williams takes an impression of the mouth and teeth with soft gutta-percha, not going into the cleft. This being chilled with cold water, gives a sharper impression than anything else he has found. The model being made, he strikes up a britannia metal plate of the desired thickness, and with soft solder attaches clasps the same as if it were for artificial teeth. A loop of wire of the general shape, size, and direction of the cleft is then soldered to the posterior edge and upper part of the plate, and to this wire is attached a piece of modelling compound, the recipe for which I have, and hope to give to you later. Then the plate with the modelling compound is placed in the mouth and into the cleft, and the patient is directed to swallow several times. This gives an accurate impression of three sides of the cleft, the two lateral edges and the pharynx. The lingual side of this lump of impression-

material must be carved into the shape of an ordinary alveolar arch. The upper side must have some of the impression wax added or cut away until the patient is enabled to produce satisfactory speech. The plate and impression, being removed from the mouth, are duplicated in rubber, the palate part being made into the form of a hollow box, and the whole is vulcanized in a vulcanizer that admits of being screwed down after thirty pounds of steam pressure has been reached and when the rubber is as soft as it can possibly be. This results in a complete piece of work at the third sitting.

Dr. Michaels's paper on Saliva I must not undertake to discuss under these circumstances, because, in the first place, I could not do it justice, and, in the second place, you will get a much more accurate conception of what he is trying to do from the admirable *résumé* in the *Dental Cosmos*. Only this I may say: This is the first time, so far as we know, that careful and scientific investigations have been made of the salivary fluids along these special lines, and the results obtained are striking. Two or three pathological conditions were, it seems, positively recognizable from examination of the saliva without even seeing the patient, and it looks as if some light would be shed upon the processes of dental decay through these investigations. Dr. Michaels has again taken up the study of what used to be known as the chemico-vital processes, and while finding diagnostic symptoms on the one hand, it looks as though the question of dental decay on surfaces which are not defective would also receive additional light.

The last subject to which I would call your attention is the system of crowning and bridging devised by Dr. W. S. Davenport, of Paris. He particularly emphasizes the importance of the accurate fitting of all caps carrying teeth or biting surfaces to the teeth or roots to which they are adapted. These caps should be made of platinum.

Secondly, he advocates the surrounding of each cap with wire from 12 to 20 gauge, 20 being the smallest and generally preferable, in order to flow clasp metal over the wire, thus forming a bulbous tuberosity shaped like a tooth and, while not losing its accurate fit, giving great additional strength.

Thirdly, he advocates one point of attachment and one or more points of rest, which it will be seen does away with the usual manner of firmly cementing two or more teeth together.

Fourthly, the procurement by some means of a perfect occlu-

sion between the bridge and the opposing teeth, so that the balance of parts is thereby restored.

Fifthly, he advocates the use of gutta-percha in solution as the cement for attaching these caps or bridges. He believes that a piece firmly cemented to two or more teeth will, in the course of a few months, break away from all but one of its attachments. The modes of procedure, with illustrations of the process, have been promised to me for the Institute, and I hope to have the pleasure of presenting them at some future period. I only mention it at this time that Dr. Davenport may derive the credit he so richly deserves.

AN INTERESTING REGULATING CASE.

BY DR. JOHN E. HEYKE, NEW HAVEN, CONN.

ON May 21, 1900, a girl ten years of age came to my office to have one of her central incisors regulated. The history of the case is as follows:

At four years of age the girl fell off the porch, her mouth striking some object on the ground, forcing the left central up between the alveolar plates, entirely changing the position of the permanent incisor then being developed. When the permanent tooth erupted it was found to have a horizontal position, making its appearance immediately under the floor of the nose and entering the lip just above the labial fold, not being visible at any point. Gradually it had worked its way towards the outside of the lip, and at the time mentioned nothing more than the cuticle covered it on the outside.

The impression of the mouth was taken and an appliance, consisting of gold caps and a bar crossing the space of the left central, was made and cemented in place. The tooth was then liberated from the tissues of the lip, and all the soft tissues underlying the tooth were divided.

About three weeks after the appliance was put on the right central and the two laterals became very tender, and the misplaced member very loose, so an absolute rest of two weeks was given. This occurred at three different times during the regulating period.



January 8, 1901, the tooth was in its proper place, having been turned from a horizontal to a vertical position and moved down considerably over half an inch.

The tooth is dead, not, however, from the process of regulating. The appliance used consisted of the before-mentioned gold caps and rubber bands.

The illustration represents the completion of the operation, with the retaining appliance still in place upon the cutting edges of the incisors.

FREE USE OF TOOTH-BRUSHES ESSENTIAL FOR HEALTHFUL PRESERVATION OF TEETH AND GUMS.

BY DR. B. F. ARRINGTON, GOLDSBORO, N. C.

Now and then we see healthy mouths (teeth and gums), but they are rare exceptions, not more than two or three cases in a thousand, possibly, in which there seems to be no need for use of tooth-brush or other means to keep the teeth and gums in a normal state. Such exceptions are not confined to any nationality, race, type, or grade in society. We may safely venture to assert as a fact that mouths (teeth and gums), as a whole, are almost universally in an abnormal state from childhood to old age, and, coupled with this, it is a lamentable fact that since the establishment of the first dental college in this country to the present time, when there are forty or more, and dentists, twenty-six thousand at least, located and practising in every section of our country from Maine to Mexico, there has been no cessation of the diseases of the teeth and gums, nor effort made to any great extent for check of causes.

To treat and patch up the ravages of disease as it presents, remove the natural and substitute artificial has been the general line of practice, and so continues without much effort to make preventive treatment effective. Much time, energy, and manipulative skill has been appropriated to repair treatment, with inexcusable neglect of *preventive* treatment, and it is to-day the general order of practice in all sections and with the most enlightened and prominent in the profession, and with those who so strenuously

contend for, and can boast of, "higher education," as with those less fortunate in educational advantages.

To reverse this order of things, and first advise and administer preventive treatment and follow when necessary with repair and substitute treatment as an alternative, would be a wiser policy and doubtless would prove a more effective means of preserving the natural teeth and keeping the soft tissues and alveolar process in a normal-like state. It is an old saying, and true as gospel, and appropriately applicable to the practice of dentistry, that "an ounce of prevention is worth a pound of cure."

If Dr. W. D. Miller's germ theory pertaining to caries of teeth, which I believe is pretty generally accepted, is true, it is good cause why general interest should be aroused with liberal advocacy for the universal daily free use of tooth-brushes, for it is evident, taking a practical, common-sense view of the subject, that with the free use of brush and water a more perfect dislodgement and removal from the mouth of all germ products of every type can be successfully accomplished than with any or all the germicidal remedies that have been so lavishly rushed upon the market since the promulgation of the germ theory was first published.

The use of tooth-brushes for preservation of teeth and to keep the associate soft tissues in a comparatively normal state is indispensable, and when the right make and quality of brushes are rightly used the disease-checking and preservative results are perceptible and satisfactory beyond questioning or controversy. If the cause of disease is not obliterated, disease certainly is held in check and the necessity for extravagant dental operations are greatly diminished. To get back to first principles and aid nature on simple lines of preventive treatment for preservation of teeth is our first duty; then to bring in play our best skill and highest professional attainments (manipulative) when necessary to repair and substitute. Such procedure strictly followed for a generation or two, or less time possibly, will bring results that may greatly diminish the need of dentists, but the supply will be equal to the demand. The labor in practice will be lightened, expense in service and for service curtailed, more teeth preserved, and dentistry as a profession of a specialty will be more exalted and useful.

The indiscriminate selection and use of tooth-brushes as we find them on the market is more *hurtful* than *beneficial* to teeth or gums. On an average, not one brush in fifty found on the mar-

ket, principally in drug-stores, is practical in structure and quality of bristle for effective application for thorough cleansing of teeth without detriment to the soft tissues, therefore not desirable nor admissible for daily use. The fault lies somewhere, and the indifference and neglect in the production of tooth-brushes will continue, and possibly increase, if investigation is not made and improvement encouraged and demanded. More consideration and careful study should be given to the subject. The work should commence and be continued in dental colleges, and dentists generally should study and discuss the subject freely for mutual benefit, and talk freely in an educational way with patrons and demonstrate to them the necessity for the free use of tooth-brushes, pointing out plainly wherein benefit is to be derived by the use of brushes, commencing with early childhood. Practical education in the use of the brush is requisite, and must be imparted before full benefit can be derived. The results attainable will amply compensate for the expenditure of time and effort requisite for proper instruction.

Holding to the idea, as I do, that there is much reckless extracting of teeth and an unnecessarily large number of teeth being filled and crowned, and that there are possible means for prevention of such practice to a large extent, with increased benefit to teeth, I feel it to be my duty and the duty of all dentists to make every effort possible for such a result. For success on this line, improvement in pattern and production of brushes is essential, and the increased right use of them must follow, commencing systematically with the period of childhood and continuing as a daily practice, that good may be accomplished for the healthful preservation of teeth and greatly lessen necessity for the use of scalers, pluggers, and forceps.

Large-sized tooth-brushes with bristle tufts closely set are very objectionable and never should be used. There can be no reasonable argument offered to justify the use of such a type of brush, yet there are many of them on the market, and are highly recommended by some dentists, and are freely used, with injury to gums and no benefit to teeth. There are many patterns of brushes and grade of bristles in use that are seriously objectionable, and should be condemned and discarded.

I will ask, Would it not be well for dentists to advise with and instruct manufacturers of tooth-brushes, supply dealers, and drug-

gists on the subject, point out to them the *practical* and *impractical* features of the brushes on the market, and inform them of the needs of dentists and the public, a good line of practical, effective, tooth-preserving tooth-brushes?

It would be a humane service, and if heeded would prove a reliable and saving help in treatment for health and preservation of teeth and gums. There has been and is at present too much indifference and too little thought given to the subject.

More practical tooth-brushes and a more liberal and general use of them, with systematic use of toothpicks made of quill, whale-bone, or wood, better shaped than those in general use, would greatly diminish caries in teeth, formation of deposits, and disease of the gums.

The chief object in result in the use of tooth-brushes is to cleanse the teeth and free them of impacted substances and excess of germ products, and not, as many seem to think and practise, simply to whiten and beautify the surfaces of teeth exposed to view. Education must correct the error.

A tooth-brush for effectiveness should not be extreme in any feature, but better be too small than too large. The following outline of pattern of brush is simple and practical, and has given perfect satisfaction when used. From fifteen to twenty tufts of bristles in a brush is ample for effective use. The bristles should be of medium stiffness and from one-half inch to nine-sixteenths inch in length, bristles as set in brush seven-sixteenths of an inch in width, and from one and one-quarter to one and one-half inches in length, with space between rows across the brush from three-eighths to one-quarter of an inch each, brush slightly pointed, with bunch of tufts of bristles near the end trimmed to a point, and each row of bristles serrated one-third or half the length of tufts. A brush so constructed and proportioned might be termed a self-cleansing brush. It is always free of impacted accumulations, and can by proper manipulation be made to reach easily every division of tooth surface, fissures, and indentations possible to be reached and cleansed with a brush.

The use of such a brush in moderation, from three to five times daily, at rising and retiring and after each meal, requiring not more than one minute of time for each brushing, will prove a wholesome and profitable practice, and should be systematically indulged when possible. It is all-important that a reasonable

quantity of water shall be held in the mouth while exercising use of brush: it aids materially in dislodging and removing successfully all impacted accumulations and excess of germ products, bacteria, microbes, etc. To follow the use of the brush with finger-pressure on gums is a good practice: it tends to keep the gums firm and healthy.

The brush and water practice with the aid of finger-pressure is preventive treatment, simple and practical, and is a surer means and guarantee of results desired, well-preserved teeth and gums, and freedom from unwholesome taint of breath, than can be effected by any other line of treatment. The idea that the mouth is a cess-pool of disease-producing germs, that requires for holding in check the daily and hourly use of some of the many *medicinal remedies* now in use and so extravagantly endorsed, is an absurd feature in theory and practice, and should not be encouraged. It is out of reason and is not sustained by good results perceptible with teeth or gums.

This to some may appear a small subject (tooth-brushes), but it is an important one in the interest of health and comfort, and requires that much thought shall be given to it and much shall be said about it that good may be accomplished, not in the interest of a few, but many, of the human family. All are liable to suffer from an abnormal state of the teeth and gums through neglect.

As evidence of the beneficial effects of the use of tooth-brushes let us inspect carefully the condition of the teeth and gums of persons (old and young) who practise daily the use of the brush, and contrast with the condition of those who neglect and ignore the use of it: the difference in result is plain and convincing, and should stimulate thought and advocacy of effort for a more general use of tooth-brushes,—a practice which, if strictly observed, would in all probability, in a limited period of time, greatly lessen the necessity for extreme dental operations for the preservation of teeth. As preservative of the teeth, so with the gums; the gums would seldom be diseased to the extent of requiring treatment as is now administered. It is seldom the case that we ever find a well-defined typical case of Riggs's disease (*pyorrhœa alveolaris*) in the mouth of a person who indulges the systematic daily use of the tooth-brush. Another instructive and convincing fact is, that in communities and families educated in the use of the tooth-

brush and who make free use of them, the above-named disease is of less frequent occurrence than in communities and families where the use of the brush is neglected. I have for some years past given much attention to the treatment of said disease, and can say truthfully that I have no recollection during the past ten years of seeing a bad case of the disease in the mouth of a person of any age, male or female, who practised the use of the tooth-brush several times daily. Such facts are pointers, and merit consideration. Careful study on such lines, with a reasonable amount of experimental work for convincing facts, would possibly enable us to do much for the preservation of teeth and keep the gums in a comparatively normal state.

Until effort is made, intelligently and upon *conservative* lines, we will never know what can be accomplished with tooth-brushes for the preservation of teeth and gums. There is work before us, and the field is broad, that all may work that will.

In our experimental work to preserve teeth without filling and crowning to the extent now practised, and to check pyorrhœa alveolaris in its incipency and keep the gums in a healthy state, and keep germ products in check without the aid of the daily use of antiseptics and disinfectants, we must keep in mind the fact that such results accomplished will be more truly scientific, more in line of duty and progress, and more meritorious than the present-day practice of inserting large display fillings and crowning and the sundry modes of treating pyorrhœa alveolaris.

Pluggers and scalers are valuable implements, and the use of them essential when needed in treating for preservation of teeth, but to spare them when possible and legitimate is a duty that should be strictly observed.

The distinguished Dr. Miller, who is regarded as the highest authority pertaining to germ products and their influence upon diseases (numerous), stated, as much as a decade back, that "during the last few years the conviction has grown continually stronger, among physicians as well as dentists, that the human mouth, as a gathering-place and incubator of diverse pathogenic germs, performs a significant rôle in the production of various disorders of the body, and that if many diseases whose origin is enveloped in mystery could be traced to their source, they would be found to have originated in the oral cavity." Not least among the diseases mentioned as caused by germ products generated in

the mouth are caries and pyorrhœa alveolaris, with the evil results of which, when neglected, all of us are familiar, and knowing, as we do, the difficulty and cost of treating successfully when well advanced, we should combine in effort to prevent or check progress in the stages of incipency, which is possible and can be most successfully accomplished by daily care of the mouth in the free use of tooth-brush and water.

Reviews of Dental Literature.

ACTINOMYCOSIS.—MM. Berard and Nicholas have proved that the spores of this parasite can preserve their vitality more than six years. They are killed by fourteen minutes' exposure to dry heat at 80° C. Sunlight kills them in fourteen and a half hours when in a liquid; when dry they are unaffected.—*L'Odontologie*.

A TREATMENT OF PULPLESS TEETH, a paper read at the International Congress. By M. L. Quintin, of Brussels.

The writer reports seven thousand cases treated in the following manner, with but one failure.

Where there is no pericementitis he washes the canals with hydrogen peroxide, twelve volumes, dries and seals the apex with a paste made of iodoform and five per cent. formalin. Where there is pericementitis he washes with peroxide and leaves the tooth open, save for cotton loosely packed, for a day. At the next sitting, after washing again with peroxide, he pumps a drop of forty per cent. formalin into the canals, packs the canals with filaments of earth wet with five per cent. formalin, and leaves till another sitting, at which time he dries and fills with the iodoform and formalin paste.

It was in this class that he met with his one failure in seven thousand (quite a notable showing), in the case of a chlorotic young girl who demanded the immediate extraction of the offending tooth, which proved to have a sac twice the size of the crown of the tooth.

When there is pericementitis, and a fistulous opening exists, he washes, dries, and fills with paste at once, the fistula heal-

ing after three or four days. At this point he remarks that in the case of certain teeth, the incisors particularly, it is necessary to proceed with some caution when the fistula is of long standing. In such cases the apical foramen is liable to be larger than is common, and it is necessary to guard against the danger of pushing the paste through into direct contact, in any considerable quantity, with the pericementum.

As the writer says in his paper, there is nothing especially new in this treatment, but the success of the method, one failure in seven thousand cases, is greater than most advocates of other systems of root-filling can claim.

Doubtless among the many antiseptic powders at our command a substitute could be found for the objectionable iodoform.—*L'Odontologie*.

SYPHILITIC LOCALOSIS ALVEOLARIS (PYORRHŒA ALVEOLARIS). By E. Lennox Curtis, M.D.

Dr. Curtis believes that many, or, it would seem, most, cases of pyorrhœa are due to a syphilitic taint. Where the white patches that one sees in the mucous membrane of the cheeks of some patients, which he well terms "egg-skin eschar," are present, he feels especially sure of his diagnosis. But to confirm it he has examinations made of blood fresh from the patient. "The examination of more than one hundred cases revealed strong evidences of syphilis, and in every instance when the egg-skin eschar was present the blood showed unmistakable proofs of the taint; in fact, in every case where the blood showed this the egg-skin eschar was present." As proof of his theory Dr. Curtis cites the fact that such cases get well and remain so when placed on anti-syphilitic treatment.—*Dental Cosmos* for February.

THE BEST FILLING-MATERIAL FOR THE TEMPORARY TEETH. By John J. Bushe, D.D.S.

For the temporary teeth alone Dr. Bushe recommends copper amalgam, for the following reasons:

"It prevents recurrence, or extension of decay, being antiseptic and non-shrinkable. It is so plastic that its manipulation is a delight. It is so slow setting that no haste need be made in the operation, although its easy working makes it possible to put in a filling more quickly than any other material. It may be placed

in close proximity to the pulp, being non-irritating, and can be inserted without making pressure thereon. It is not affected by the presence of saliva, either in the cavity or on the unfinished filling, as are all the other plastics; no special pains to have perfect dryness is necessary. The filling is more easily and quickly finished than that made from any other substance."

To these well-founded statements Dr. Bushe adds that in ten years' experience he has never found any wasting of the amalgam in temporary teeth.

GOLD BLINDNESS, OR RETINAL ASTHENOPIA, AND ITS TREATMENT. By L. Webster Fox, A.M., M.D.

Yellow rays stimulate the retina and after a time cause it to become exhausted (retinal asthenopia) to the degree that in the eyes of those most readily affected a blind spot temporarily exists. From this it happens that an operator sometimes finds the outline of the cavity he is filling growing indistinct, or even disappearing. Those suffering from hypermetropia with some astigmatism, or from muscular insufficiency, are most inclined to be thus affected.

The treatment is to improve the general health, and to wear glasses calculated to correct visual defects, the glasses to be of a slightly violet color, to overcome the effect of the yellow rays.

Reports of Society Meetings.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Boston, Wednesday evening, January 2, 1901, at six o'clock.

Two papers were read by Dr. D. D. Smith, of Philadelphia, Pa., the first entitled "Prophylaxis in Dentistry," the second entitled "A Unique Method of tightening or inserting Lower Front Teeth."

[Dr. Smith failed to furnish his first paper for publication. The substance, however, will be found in a paper by him published in Volume XXI., page 805.—ED.]

President Pond.—We have to-night a subject of great interest to us. While every subject that we discuss here has for its object the advancement of our profession, and is therefore of great interest, some subjects are so practical, so perfectly adaptable to our every-day practice, that they seem of especial importance. The subject to-night is of very practical importance, a method of treatment that you can use every day.

DISCUSSION.

Dr. Smith.—Having read this paper, gentlemen, it has impressed me that I have not, after all, dwelt upon the actual methods to be pursued as minutely as I should have done. They are so clear in my own mind that perhaps I have omitted little matters of detail and not made it clear to you. I give you the privilege of asking any questions in relation to the paper and the subject I have dealt with, and I will endeavor to answer them to the best of my ability. But permit me to ask you a question. How many of you have practised at any time this method of oral prophylaxis? All that have, please hold up the hand.

Voices.—What method? What method?

Dr. Hopkins.—I do not think we quite understand the details of the method.

Dr. Smith.—Let me try to explain this method of prophylaxis in detail. In the first place, it is not all cleaning teeth. It does clean the teeth, but that is not all that is accomplished. If you will take one of these orange-wood sticks—there is a toughness in the orange-wood which makes it desirable—and some pulverized pumice-stone, and go over the surfaces of the teeth, using a well-sharpened stick and going well up into the festooning of the gum, even on what may appear to be a clean tooth, you will find that there is a greater difference in the appearance and in the “feel” after the operation than you would have predicted. The sense of touch will enable you to recognize that you have taken something off the tooth, although you may not be able to see what it is. Now, that condition exists on all surfaces of the teeth, not on the outside alone, but on the inside, between them, and even on the occlusal surfaces. The lower sixth- and twelfth-year molars and the wisdom-teeth on the lower jaw should be just as thoroughly and carefully polished on the inner or lingual faces as they are upon the outside or buccal; and all in between the teeth just

so far as you can get your stick, reduced to a thin, wedge-shaped point, and pumice to go. Every tooth is to be thoroughly polished, all exudations from the gum, gatherings of food particles, the deposit from the saliva and mucus during the night are to be thoroughly removed, and every portion of the exposed surface of the tooth is to be left in a perfectly polished and smooth condition. That is what I mean by this treatment, gentlemen. I claim in the paper that it is utterly impossible to do this with the wheels. It must be done by hand and with hand instruments.

The treatment as outlined stimulates the teeth to throw out and deposit new and better tooth-material; the teeth under this stimulation become better; the internal vital functions seem roused to new activities. Give a patient three months, if you please, under this treatment, and after three polishings, whether you start with young teeth, teeth in middle life, or whether the subject be an elderly person, there is not an individual practitioner who will say that it has not benefited the teeth, or that the character of the tooth-material is not actually better than before you commenced the treatment.

Dr. Andrews.—Any massage at all with the fingers?

Dr. Smith.—Not at all. It is all done with sticks and pumice.

Dr. Eames.—Do you use the finest?

Dr. Smith.—Not the finest. Why pumice-stone? Because of the grit, and because the pumice-stone will float in the liquids of the mouth and there is no danger of its remaining between the gums and the teeth. I used to teach patients that it would not do to use pumice-stone because it would work down under the gums and cause their recession from the teeth. Instead of this, the pumice-stone floats and is immediately washed away.

Dr. Boardman.—Will you please pass around your instrument?

Dr. Smith.—Certainly. Considerable of the surface can be reached with just the plain stick, as you know. Some are larger than this one which you see here. Larger ones can be had, and they are better to handle. They can be kept in condition while working with them simply by whittling them down a little, and cutting off the brush end from time to time. I have half a dozen of the porte-polishers at hand, that I may not be inconvenienced and retarded when at work. And I have these two forms, but varying sizes of the sticks, and that is about all. But as I go on

with the polishing I try to keep them in condition so they will do the work, not letting them get too soft at the points.

I wish to say, in regard to this instrument, that it was devised by Dr. Louis Jack years ago, not for this purpose, but for cleaning teeth after the old methods. It was for use after the occasional removal of tartar. Very few of these devices were ever sold, and they have so long been obsolete that the younger men know nothing of them. As an illustration of how they were appreciated by the profession, I had one in my office, and when I wanted some more, I was informed by the S. S. White people that they had none. They would not make a single one, but they would make them up for four dollars apiece if I would take half a dozen of them. I took the instrument to another maker, had it modified a little, and now they can be obtained in any quantity at a reasonable price from Dr. Ivory. It is precisely the same pattern of instrument, but a little smaller in some of its parts and more convenient for use in the mouth.

Dr. Eames.—What is the price of this?

Dr. Smith.—They retail, I think, for two dollars and twenty-five cents or two dollars and fifty cents. With these instruments, as can readily be seen as they are passed to you, any part of the mouth and any part of a given tooth can be easily reached.

A gentleman said to me the other day, "I have done something in the line of prophylaxis myself, doctor, and I think I know something about it;" and went at one of my patients, who was kind enough to submit to be presented to him, with a seeming determination to find some cavity or some fault in the mouth, I having said there had been practically no decay and but one filling placed in the teeth since the treatment commenced.

The prophylaxis which this gentleman a number of years ago had had something to do with was the suggestion of hot air for the treatment of devitalized teeth and for sensitive dentine; and he had also used it injected between the teeth to destroy the injurious agents which were at work there. Now, that is one thing, but it is not the prophylactic treatment which I am suggesting. Mine is a method of obtaining change of environment for the teeth in the mouth, a positive, systematic, and effectual change of tooth environment. It is by this method alone that I am able to accomplish it.

Another thing which has impressed me more recently is the peculiarly healthy condition which the gums take on after two or

three treatments. That there is an exudation from the gums and from the alveolar tissue which lodges on the teeth is unmistakable. In this respect the teeth are analogous to the fingernails: leave them without due care, and there will be the same irritated condition, accompanied, in extreme cases, with pus discharge such as is often seen about the teeth.

A question from one of the gentlemen examining the cases in my office may well be answered here: "Do you go up into the festooning of the gums with your polishing instruments?" That, gentlemen, is one of the things that I do, go with the polishing instruments up to the festooning of the gums, and if I make them bleed I do not regret it at all. I do not aim to do that, but I do aim to remove from that part of the tooth, the cervical portion, all the exudation from the gums as well as all the extraneous matter there. In some cases it should be done oftener than once a month. But done once a month, it will produce stimulation to the gum-tissue, stimulation to the alveolar tissue, stimulation to the whole oral structures, inducing the most attractive and apparently the most perfect condition of the mouth attainable.

Dr. Andrews.—Would you use considerable force?

Dr. Smith.—Use whatever force may be necessary to get the surface absolutely polished or clean. You can tell very readily, after polishing a few sets of teeth in this way, when that is accomplished. Now, I ask you once more, How many have undertaken it?

Dr. Meriam.—I think we have all done something of it.

Dr. Smith.—I have no doubt you have cleaned teeth.

Dr. Meriam.—Cleaned for a purpose.

Dr. Smith.—Have you produced this condition of the mouth which I describe as the result of this system of treatment? If you have not, I want to ask of you, not for my benefit, but for your own, that you will undertake at least one case from this time for three months. Select a member of your own family, your wife, if you please, or one of your children who needs the treatment, and do it thoroughly and conscientiously. Do it in the manner we have endeavored to teach that it should be done. Discard power polishers, using only orange-wood sticks and pumice. At the end of three months note the results, and write to me giving your experience, and see if you are not as much astonished and gratified as I have been.

Do not attempt to bring it into all your practice. I have not done it in a day. It has taken three years to bring fifty patients fully under the system. I have not suggested it to every one. I have not felt secure and on a solid foundation until more recently, but I have done it now in a sufficient number of cases and with sufficient fidelity to know what the results are. If you have a breath in the family that is not always sweet, try it there, and see what the result will be on the breath.

I wish to make another statement to you. I will not place it in the paper, but I make this statement: that of the fifty patients, there is not one who has been six months under the treatment that has not improved in general health, some more than others.

Dr. Andrews.—About how much time is required for a treatment of this kind?

Dr. Smith.—It will depend upon the number of teeth in the mouth and the frequency with which you practise it. After becoming expert at it you will do it much more readily, and you will find that you will go over a set of teeth much easier after they have been treated two or three times. It requires from half an hour to an hour for a treatment.

Dr. Eames.—I would like to ask if you consider cases of loosening, so-called pyorrhœa, and in what stages of advancement, and with what success?

Dr. Smith.—Would you like to hear the results from one of the worst cases of pyorrhœa I have ever had for treatment? I invited ten gentlemen to my office, as I said, only last week for the purpose of seeing this case. The mouth had been under my care for at least fifteen years, but I had made no progress at all in the treatment of the case. It had rather been going backward all the time. It is one of those cases where the crowns are very large, the teeth constricted at the necks with short roots; a small mouth, exceedingly difficult to work in. During the years I have had the case in charge there has been a gradual increase in loosening, in recession of the gums, and in pus discharge. Two or three of the lower front teeth and some of the molars have been lost and the trouble seemed uncontrollable.

About a year ago I became convinced that this method of treatment would certainly do the most that could be done for the cure of pyorrhœa, and so I commenced vigorously with this pa-

tient. In the beginning I saw her once a month. At the end of the first month there seemed little change, but after three treatments I saw an improvement. And last June—she is a lady who lives in New York and had to come over to Philadelphia every month—she came to the shore to stay for the summer. I said, “You must come to my office once in two weeks.” The teeth, those that were left, were quite loose. I had a little piece of bridge-work in the mouth, three teeth on two roots that had gotten loose. I thought all the teeth were going, and I felt very badly about it, because the patient had been so anxious to save her teeth. She came during the summer as desired, once in two weeks. And, gentlemen, I have to say to you that to-day those gums have taken on as healthy a condition as could possibly be desired. The alveolar process has not returned; the gums have not closed down where they originally were, but they are in a healthy condition. There is no discharge of pus, and the breath has lost the fetor which formerly pertained to it. And the teeth have tightened, until to-day they are perfectly comfortable. They are not absolutely tight, but they are so near it, and in such a healthy condition, that she masticates with perfect comfort.

I showed the case to at least eight gentlemen, some of the best practitioners of Philadelphia, as an example of what this treatment will do for pyorrhœa, it being one of the worst cases which I have ever had to treat.

What is the explanation of it? To me it is this: there is an exudation from the gums, or a discharge of pus from the alveolar structure and gums, which lodges at the cervix and at points which it is impossible for the patient to reach. Becoming inspissated at the constricted parts of the teeth, it undergoes decomposition, especially at night when the muscular system is relaxed and the mouth generally open. This toxic matter cemented on the teeth becomes more and more irritating. It is often attached to the roots of the teeth with great force. And how shall it be taken off? You know how Dr. Riggs used to do. It has to be removed by skilful manipulation. And having removed these irritating substances once, are we to abandon them and let the exudations from the unhealthy alveolar and gum structure reaccumulate? They begin at once to re-cement themselves on the teeth for their destructive work. What shall we do. Keep them off. Is not that the treatment? And if kept off, the pus discharge will stop and

the gums will assume a healthy condition again. It is not medication that is required for pyorrhœa; it is rather relief from the irritation of toxic accumulations on and about the teeth. Frequent change of environment, with soothing local medication, is what is needed and what will certainly give the best results.

Dr. Hopkins.—Mr. President, I do not know how the other gentlemen have been affected by this paper, but I can say that it has been a great gratification to me to hear such enthusiasm, and that I am a firm believer in what the essayist has said. I believe that it is possible for a dentist to take a child through life without that child ever having a toothache, a dead tooth, or a serious operation, except in most extraordinary conditions. I think that we have all somewhat backslidden, and that such a paper as that which has just been given us is what we need to stimulate us to renewed effort.

I was brought up in the office of Dr. E. J. Dunning, of New York, and his successor, and I have always used the orange-wood stick in the manner described by the essayist to cleanse teeth.

It is, I think, a perfectly safe thing for a dentist to say to a parent, if you will leave the child in my hands and allow me to see the child when I send for him, I can promise you security from any serious trouble.

It seems to me that we need to set our standard very high, so high that we will have to keep struggling all the time to keep up to it. I do not think it is as difficult a matter to control our patients as some seem to feel. I think that it is just as well to control our practice as to have our patients control us. It is much more satisfactory.

It is my practice now, with a great many of my patients, when they leave the office, not to say to them, come in again in three months, or in six months, but to say, I will send for you when I want you, and I expect you to respond. If I find there is nothing to be done, the patient is usually grateful, and is willing to pay the fee for examination. If I find that there is an accumulation of work, that large cavities exist, I am mortified because I have made an error in judgment. I ought to have sent for the patient earlier. I never have carried my practice to the extreme that the essayist has suggested, but I have been weak, I realize, weak in not asserting what I have believed to be the truth. I consider this an extremely helpful and timely paper.

Dr. Smith.—Allow me to interrupt you just here, as the gentleman made a remark which reminds me of one thing I had forgotten, and that is in regard to the way I deal with these fifty patients that I speak of. I give them at the time of treatment an appointment for the following month. I have my appointment book so arranged that A coming to-day for this treatment takes an appointment for the same day the next month. When I speak of having fifty cases, I mean fifty cases where I have a regular standing appointment with them from month to month.

Dr. E. H. Smith.—Permit me to ask the essayist if he uses polishing-strips between the teeth, or is he able to reach all the inaccessible places with the orange-wood sticks properly shaped?

Dr. D. D. Smith.—In reply to that I wish to say that I never use the strips at all as part of this treatment, but I do frequently use silk for going in between the teeth. I rely on the sticks properly shaped to get in between the teeth. Understand me, I do not expect to stop every particle of decay. My belief is that nature placed teeth close together, in the position that we find them, for a purpose. I certainly should not feel that it is necessary, and it has not proved necessary, to separate them for the purpose of getting strips, or anything of that nature, between them for polishing. It can be done altogether with these sticks, supplemented where necessary with floss silk.

Another thing I wish to say, that I enjoin the greatest care on the part of patients in the use of the brush; they are expected to have what I conceive to be a good brush, and I insist upon their using it, and also a good tooth-powder. There is what I consider a good tooth-powder made here in New England,—Caulder's Dentine. And then I request patients to use fine salt at least once a week. Other than that I do not exact anything from them in the way of cleaning. But if they come to me with the teeth showing neglect, they always get scolded, and particularly the children and the youth that are under the treatment. I am very careful to enjoin upon them that they must exercise care as well as myself.

Dr. Brackett.—In the paper which has been put before us this evening there are many points about which I would like to speak; but if I said all that has come to my mind, there would be no opportunity for any one else. I think that we, as members of the Academy, should be able to disabuse the mind of the essayist

of the idea, if it is there, that Dr. Taylor has been other than an earnest admirer of his practice and an honest representer of its merits. So far as my acquaintance goes, Dr. Taylor has done more than any other dentist in this region to put in practice Dr. Smith's methods. To this he gave testimony when he appeared before us last May; and with an increasing number of patients and with gratifying results, he has continued the practice up to the present time. Those who heard Dr. Taylor's paper and remarks will testify that he gave great credit to Dr. Smith, and that he did not claim for himself originality or any personal glory whatever.

I was a student in the office of Dr. Taylor. For years we both had the privilege and advantage of an intimate acquaintance and intercourse with Dr. Riggs; and it is true, as our essayist has well said, that Dr. Riggs is deserving of honor. I believe we all appreciate that he was a pioneer in pointing out the local etiology of pyorrhœa alveolaris, and in thoroughly and successfully treating it with peculiarly shaped instruments of his own devising and of far-reaching capacity. With them he sought to remove from the teeth, with the utmost particularity, all calcareous deposits, however far beneath the gum they had penetrated. He taught also the removal of the necrotic border of the alveolar process, usually present in deep-seated cases, so that there should be left only clean vital tissues. And he followed the use of the scalers with an earnest use of the stick and pumice-stone. Unless in the case of a few of his disciples, I have never seen in the hands of any other practitioner such use of the stick as I have seen in Dr. Riggs's hands. It was his practice and his inculcation in his teaching that not only should the scaler remove the calcareous deposits, however far beneath the gum they might extend, but that the orange-wood stick, cut to a long, thin taper, should follow till all that portion of the root to which foreign material had been attached, as well as the crown, was made thoroughly clean and polished.

No one would claim for any practitioner who lived during the period which Dr. Riggs's lifetime covered that he did in all things what we are able to do to-day. I do not think that any of those who were most familiar with Dr. Riggs's practice would claim that he ever instituted any such thing as the systematic and thorough cleaning and polishing of the teeth once a month.

Dr. Smith.—For the purpose of arresting decay?

Dr. Brackett.—For any purpose whatever. It was Dr. Riggs's practice to go over a case of pyorrhœa as thoroughly as he could in the first operation, or series of operations. Then he instructed the patient to return after an interval of a week or two, in order that he might have an opportunity to revise the treatment, if revision were needed. Wherever he could see that the former operation had failed to accomplish all that it should, as manifest in the tone and color of the gum, in suppuration, or in any of the ways which are familiar to us, there he wished to make a revision, and to make complete that which the first operation had left incomplete. Following all, Dr. Riggs taught his patients the great value of their own efforts in maintaining cleanliness of the teeth, and the importance of their having any new accumulations of calculus removed at intervals so short that it should not have an opportunity to penetrate again beneath the gum.

Dr. Werner.—What has struck me most forcibly in the paper is the part pertaining to the treatment of pyorrhœa. Now, do we understand that Dr. Smith uses the scalers and instruments first, and afterwards the treatment with the pumice and stick.

Dr. Smith.—Oh, certainly; get everything off. I tried to make it plain that I was even more thorough in the first treatment than Dr. Riggs, and in addition to that, to follow up the treatment perpetually. The difference is in the greater thoroughness and continuation of the treatment.

Dr. Werner.—And you do not treat systemically?

Dr. Smith.—You mean constitutionally? Not at all. I do not give them even the effervescent salts that are made down in Philadelphia especially for that purpose.

Dr. Werner.—You treat it wholly as a local expression or diseased condition? That is a very strong statement, and some may heartily agree with you on that. Another thing: do you put on the rubber dam in your method of treatment?

Dr. Smith.—No, never.

Dr. Werner.—You do not, as Dr. Hart, for instance, does, put on the rubber dam and sterilize?

Dr. Smith.—Not at all.

Dr. Werner.—Do you use iodine?

Dr. Smith.—Not at all. Water, pumice, and the stick, and muscle and friction.

Dr. Werner.—Well, you certainly must believe that a tooth-brush is a great adjunct and helper in massaging the gum and in removing the exudation around the necks of the teeth. You would not advise your patients not to use a tooth-brush?

Dr. Smith.—No. I advise them to use it thoroughly, and I scold them when they do not.

Dr. Werner.—And you would certainly say that a great deal of the success is due to their treatment?

Dr. Smith.—No, not much of it. If I could see them once in two weeks instead of once in four, I would not much care.

Dr. Werner.—Another strong statement the essayist made is that the odor, the fetid odor in the breath, is so very much due to the causes that he speaks of.

Dr. Smith.—Will you let me explain that right here?

Dr. Werner.—I believe that much more comes from the condition of the mucous membrane of the post-nasal region and from the deposit on the tongue than from any decayed condition of the teeth. I should think eighty per cent. of it came from abnormal conditions of those parts and very little from tooth decay.

President Pond.—We all remember a very interesting paper on this same subject that we listened to last year. It awakened a great deal of interest on account of the new application of old methods recommended and the wonderful results reported. You remember Dr. Taylor's mentioning, as I understood it, that he received his first impetus in the work from Dr. Smith. He spoke of cases that he was treating that he had had under his care for a limited time, perhaps six months or more. I would like to hear from him what the results are to the present time?

Dr. Taylor.—It is not my purpose this evening to discuss what Dr. Smith has said in regard to my paper. I had the pleasure of meeting you last spring; I received a very cordial greeting, and we will let the matter rest where it is. I wish to reinforce one statement that he has made this evening, the value to the human family by the frequent stimulation of tooth-substance by friction, the betterment of tooth-structure, I think Dr. Smith calls it, but it means one and the same thing. There is nothing done in dentistry to-day that is as valuable in the care of the mouth as the thorough stimulation of tooth-structure by friction. This is all I wish to say.

Dr. Taft.—I assume from Professor Smith's question to the

essayist that the polishing-strip serves, in his opinion, a very useful purpose in the cleansing of teeth. I quite agree with him. The last patient that I had in my chair this afternoon, a little girl eleven years of age, will serve as an illustration to emphasize this point. With the exception of the upper and lower incisors, which were badly stained, her teeth were in what I would consider a perfect condition of cleanliness. After going over them with iodine and pumice, and with the help of the orange-wood stick, porte polishing-brushes, and dental engine, I noticed, as is generally the case, that the approximal surfaces could not be reached or freed from stain without the use of the separating saw and polishing-strip. This was done, and superficial decay discovered upon the distal surface of the right superior central. The polishing-strip in this instance served the double purpose of removing all stains and the prevention of further disintegration of tooth-tissue.

I understood the essayist to say, and correctly, I think, in answer to Professor Smith, that a thorough cleansing of the teeth by his method does not require their separation or the use of polishing-strips, and I refer to the case of which I have just spoken to emphasize the point that the orange-wood stick, no matter what its shape, or however pointed it may be, cannot be relied upon to do all that the essayist claims for it.

Disks of rubber or felt, the orange-wood stick, the separating saw, the polishing-strip, the porte polishing-brush, and the dental engine, each and all serve a useful purpose in any thorough performance of this work, and I should like to ask the essayist how, in a case like the one I have cited, for example, he would have removed all traces of stain, and how he would have discovered and arrested the process of decay without at least the use of the saw and the polishing-strip?

Dr. Smith.—I would have treated the tooth, I have no doubt, just exactly as the gentleman did. Credit me, gentlemen, with common sense. If I find decay on the approximal surface of the tooth, I remove it, filling if necessary. If I find a stain there, I take it off. If, as in this case, evidently, the teeth were only occasionally seen by this gentleman, it was found that decay had actually begun, what did he do? He did the common-sense thing, removed it, of course. Why not? Simply because you could not get your orange-wood stick in there. No, put your teeth in a

perfect condition; that is the beginning of the treatment; and do it in the very best way it can be done.

Dr. Taft.—My point was, Mr. President, that without a separation of the incisors, no orange-wood stick alone, however pointed, could penetrate or remove the stain from the approximal surfaces of the incisors at their point of contact, much less be the means of discovering or of arresting superficial decay. The teeth had first to be separated, then sand-papered, and afterwards polished. The separation revealed caries, and was but an incident in the process of cleansing.

Dr. Meriam.—The paper seems to be rich in suggestions of possibilities, though much of the matter covers the ground that we have all covered, some in one way, and some in another. If it is an indication that dentistry is progressing past the sharp mechanical line into a physiological dentistry, then I think the paper is a forerunner of a most desirable change in our practice. In a recent paper regarding the practice in Germany, it was shown that even extraction of teeth was preceded by a thorough and intimate acquaintance with the anatomy of the jaw.

If we should have a practice of dentistry that is drawn from the conditions that we find, rather than based on appliances that we wish to use, we shall certainly have then a dentistry that is much advanced over the present time. You will remember a remark I made in the Academy some years ago, that the tendency of dentistry to-day is buying things in the shops and then trimming patients to fit them, and it is fair to presume that this is the kind of dentistry that the gentleman means when he refers to the gold work.

Too much tooth-substance has been cut away in order to make the use of certain instruments possible. I have seen fillings where the labial wall was cut away for the purpose of using a certain instrument. Now, if the paper goes beyond this, if it leads away from such practice, it is an advance. We have felt this practice less here because we are at a distance from shop influence, and have therefore less temptation to use entirely the ready-made.

One dealer said to me, "You do not let your patients dictate to you; why should you expect to dictate to us?" I said, "On the contrary, every patient dictates to us," and as we discover physiological and pathological conditions and bring the resources of dentistry to meet them, we gain reputation.

There are one or two practical points suggested. I think we had a discussion similar to this when Dr. Francis, of New York, read a paper. I spoke at that time of the use of the rattan stick in cleaning teeth. That can be shaved down on one side so it is as thin as a piece of steel, and holding the powder well. I think we owe the idea to Dr. J. L. Williams, of Boston. The "orange-wood" sold in our shops is not orange, but is, I believe, a kind of willow. It is sold in large quantities by dealers in watch-makers' tools, and is known as "peg-wood." It goes down the stairs of a watch-makers' supply house, then up another pair of stairs to a dentists' supply house, and changes to "orange-wood." It costs the watch-makers five cents a bunch, or fifty cents a dozen bunches.

Dr. Smith.—It does the work of cleaning teeth.

Dr. E. H. Smith.—Do I understand the essayist correctly when he says that he believes that all cases of pyorrhœa are produced by a mechanical irritation, and if this mechanical cause is removed and followed with a thorough cleansing of the teeth, the case necessarily goes on to a cure?

Dr. D. D. Smith.—Yes, that is practically my belief. I tried to state very clearly that I believe that this local irritant may often have a constitutional expression, but the constitutional expression never exists without previous local irritation, and consequently our treatment has always been, and must be, local rather than constitutional. Constitutional treatment alone for any case of pyorrhœa will be abortive. The common-sense treatment for it is what has been outlined, the changing of the environment of the teeth, keeping the surfaces perfectly clean, and giving nature a chance to do her restorative work.

Dr. E. H. Smith.—The hour is late, and I would not presume upon the patience of this audience to carry the discussion farther. I certainly feel the value of such a paper in so far as it treats of pyorrhœa, but I cannot, by my silence even, assent that all cases of pyorrhœa are produced by this means alone. I believe that there are many cases of pyorrhœa that have their preliminary steps in a constitutional trouble; for instance, in the case of a diabetic patient. I have had several such patients under my observation, and I find that when they are under treatment by physicians, and the diabetes is somewhat under control, there is a very great improvement in the condition of the gums. I believe there are many

causes of pyorrhœa. For the pyorrhœa produced by mechanical irritation, from deposit of salts or exudations from the gum, as he states, his treatment is without question the proper treatment, and undoubtedly many of us have failed in not seeing our patients frequently enough and not carrying out this prophylactic treatment so thoroughly outlined.

Dr. D. D. Smith.—Allow me to say just one word in reply to that. He speaks of these cases of uræmic poisoning as being better when they are under constitutional treatment. I have to reply to that, that if he will put all such cases under the treatment which we have suggested, he will find that the constitutional expressions of uræmic poisoning will be much less decided. Do I make it clear?

Dr. E. H. Smith.—You make it clear, but at the same time I think that the treatment has got to be carried farther than that.

Dr. D. D. Smith.—We are not apt, as a profession, gentlemen, to agree upon the subject of pyorrhœa.

Subject passed.

A UNIQUE METHOD OF TIGHTENING OR INSERTING LOWER FRONT TEETH.

BY DR. D. D. SMITH.

The evening is so far spent that I will not take a great deal of your time with this, but it is something that I have thought would interest you, possibly, more than the paper on prophylaxis. In all probability you will bring it more into requisition. And I rather desire, if it is your pleasure to accept it, that it may be presented to the profession from this society. I entitled it "A Unique Method of tightening or inserting Lower Front Teeth."

This original method of tightening loose lower front teeth, and of inserting artificial ones in vacant spaces, without plate or visible appliance, is dependent on a practice so heterodox when squared with the ordinary orthodox ideas and methods in dentistry that it has seemed more fitting to present it here rather in the form of a talk than as a set paper. It is my desire that it have free discussion of all means and methods advocated. A professor in one of our colleges remarked, on seeing the practical case which will be exhibited to you this evening, "That is all well enough

in your hands, but I would not dare to teach it." To me the matter presents itself in this way: it is a legitimate and desirable method for these cases, or it is condemnatory and censurable. If the former, it ought to be known and taught; if the latter, it should be known to be avoided. This method has as its foundation the destruction of living pulps, usually in sound teeth, and hence diversity of opinion may arise respecting it.

A tooth without a vital pulp is not as good in some respects as one with a vital pulp. The pulpless tooth, in other words, if put to certain tests, as the tests of mechanical strain, is certainly not as strong as when its atoms are banded together by the vital force due to the presence of a living pulp.

But suppose we had some devitalized teeth in the mouth to be filled; what prognosis would we make in such event? There is scarcely a dentist in these days who would not make a favorable prognosis. We would say to the patient, we can save that tooth for you, in all probability, as long as you want it. Like any filled tooth, it may require refilling, it may be split or fractured, but practically the tooth is as good as if it had a living pulp.

I think it was put very clearly before the American Dental Association in 1899, in a paper on "The True Status of the Pulpless Tooth," that there are two sources of life to the tooth, the one an internal life, which is the nourisher of the tooth, the other an outside source of life, which unites it to the alveolus, and each entirely independent of the other. You can take away all the life from the internal parts of the tooth without in any way affecting the life distributed to the surface of the root of the tooth. It is the pericemental life of the tooth which we must maintain. We do not care so much about the pulp life; it is of very little account in certain conditions of the teeth. At my time of life, for instance, a vital pulp in a tooth is of little importance. We can preserve the tooth perhaps as well without as with it.

But how about the pericemental life? Destroy it, as in pyorrhœa, and you destroy the tooth. If we can preserve the pericemental life of the tooth in a perfect condition, we shall have a tooth for all practical uses equal to the tooth with the living pulp. The pulp is very important in young life, and we would by no means molest it then unless compelled to do so. Preservation of the tooth rests upon the treatment after devitalization.

Some men say, do not destroy a pulp in a tooth under any consideration. Why? Because they are afraid of the after-consequences.

You know how many methods there are for instantaneously destroying pulps. But can you destroy a pulp in a wisdom-tooth, for example, in that way? With perfect access to pulps, as in single-rooted teeth, no doubt the method is applicable. But there is a far better way, gentlemen, of destroying pulps, and that is with arsenical paste. Do you say an arsenical application will give pain? Not if it is properly applied. An arsenical application should never be made directly to a pulp, but always to living dentine. Complete devitalization will result in forty-eight hours, and there will be no pain attending it.

It is not necessary that the application should be deep in the tooth, but it must be in contact with living dentine. It must not be confined with cotton or any of the cements, but rather with some of the preparations of gutta-percha.

Now, another point. After devitalization, treatment for the removal of the pulp must be instituted, and the limit of time should be between forty-eight and sixty hours. I never use a nerve-broach for extracting a pulp. Why? Because I do not believe in them at all, and because they do not affect or bring about that condition of the root-canal which is requisite for its permanent comfort. We want to remove not only the pulp-tissue, but the membrane also which lines the canal, and we want, likewise, to remove a portion of the dentine from the root of the tooth; and this is the reason why it is best always to use the drill. The removal of the pulp with the drill insures free access to the root, and it takes from the root a portion of the dentine and of interdental matter which is subject to decomposition. It takes out that which always has been, and always will be, in cases of nerve-broach removal, a menace to the comfort of the tooth. I cannot now continue the details of pulp-canal treatment, but, assured that we are in the line of duty in devitalizing sound teeth, that they may be used as supports for sustaining other teeth, let us consider the little piece of work which I have to present to you this evening, and which I will now pass around for your inspection.

I want to say that I devised this method some eight years ago and have used it in many cases, both for tightening lower

teeth and for the support of artificial ones, but it has taken me up to within the last six months to get it in its present perfected condition. This appliance is just as effectual for tightening loose teeth as for inserting artificial ones. If you have two tight teeth in which to place these supports, all will become immovable and secure. Where you have a case of pyorrhœa, for instance, and the alveolar process is nearly all absorbed away from the teeth, and where you want to retain the natural teeth and make them comfortable and useful, this appliance will enable you to do that. If any are gone, you can with the same appliance supply the missing ones. You will better understand how it is done by examining this little specimen than by any description which I can give it.

I have tied one of the little supports to the cast which slips into the right lower cuspid, and that shows the form of the support as first made and fitted into the tooth, and as this goes about I will endeavor to explain how to fit it. As you see the appliance you will divine how it is made and will understand the principle of the support. The cuspid teeth are almost always the ones to which you can attach this support. I have a practical case in the mouth of a patient here, who has been kind enough to come on with me, and I hope he is going to make a speech to you by and by, for he is *the* after-dinner speaker in Philadelphia. This cast is a representation of his mouth before the teeth were put in, and you will have an opportunity to see the case in its practical working.

The preparation of the teeth for the reception of this appliance is a very important part of the operation. I used to cut away from the cutting edge of the tooth, and from that down until I could get my supports in; but I no longer touch the cutting edge of the tooth, but go down near the gums to the thick portion of the tooth, where you can cut away without doing it any injury whatever. It took me five or six years, with the infrequent application of this principle, to discover the advantages of this more recent method of preparing the teeth. Cutting from the lingual face and into the thicker part of the crown, we can get ample space for strengthening the supports with solder without changing the form or enlarging the tooth.

Now, having cut from the palatine face as indicated, and enlarged the canal, take an eighteen-carat gold wire about 15

or 16 gauge and fit it into the root, giving it a sufficient length to get a real support. Next take a piece of No. 30 pure gold plate large enough to cover the lingual face of the tooth, make a hole through it, and push this pin or wire down into it; put the pin in its place in the tooth, carrying the piece of gold plate with it, burnish the piece of gold onto the tooth itself at the point where it has been cut away. Cut off this piece of wire so the top of it will stand just above the tooth. Then you can make an impression, if you desire (I seldom do that), to enable you to handle it with ease until the final finishing of the case. Now just tack the piece of gold, after it has been fitted down on the tooth, with solder to the pin; after which you can adjust it perfectly to the tooth itself and contour the lingual attachment, strengthening it at the same time with solder. You want at least two of these supports in good firm teeth. There may be more of them if you like, as in this case, where I have three. The cuspid teeth are to be preferred for supports or piers.

Having the supports in the teeth as indicated, a plaster impression should be secured in which the supports will be securely embedded and may be removed without changing their relation to the teeth. Great care is necessary in making the cast from this impression, the teeth being small and usually long, but once made, the artificial teeth are to be fitted to it as though it were the mouth. You will notice that the gold on the lingual face in the specimen before you is shaped to perfectly represent the corresponding face of the natural teeth. The whole operation is a delicate one, and requires exact manipulation; it cannot be sent out to the mechanical dentist. You have to do the work yourself; at least, I have always had to do it. The teeth and the gold tubes are accurately fitted to the gums, a method which I use in all bridge-work. For facings I use the English (Ash & Sons) teeth almost exclusively.

With each individual tooth completed in its lingual construction and in its adjustment to the cast, they should be waxed together and to the supports in the plaster teeth. To avoid displacement after waxing, I cut away the plaster teeth in which the supports are embedded; this frees the piece from the cast when it is ready for investing and soldering, a part of the work which requires great care. When soldered and finished, the case is ready for adjustment.

One of the desirable features of this appliance is the fact that the rubber dam is always applicable in its adjustment. The dam should be applied to as many teeth as may be necessary to give untrammelled access to the teeth which carry the supports. Having applied the dam and completed the treatment of the roots, with a good cement the final adjustment of the appliance, whether it consists solely of these supports for the tightening of loose teeth, or whether it carries one or more teeth, is readily accomplished. Any length of time may be given the cements to harden, as all is completely protected by the dam.

The case, when completed, exhibits no gold, has the appearance of the natural teeth, is perfect in cleanliness, and presents nothing as unnatural or objectionable in the mouth to the patient.

It is difficult to describe in comprehensible terms details for the construction of an appliance such as this, but seeing this specimen, you will be fully able to catch its meaning. And now, if any one would like to ask questions before we examine the practical case which we have here, I shall be glad to answer them.

DISCUSSION.

Dr. Meriam.—How long have you had one of these in use?

Dr. Smith.—I made my first case, using this principle, fully ten years ago. I have had one in that mouth with pyorrhœa, that I was speaking of, for five years. It is not as good as this one is, because I had not then the process under control as now, but it is the same in principle.

I may be permitted to say that the gentleman who was in my office, apparently endeavoring to find fault with every condition possible, said of that case, which I regard as antiquated, "I cannot find any fault with that."

These cases are comparatively infrequent in practice, but the device is most satisfactory when it is needed. You will find many of these cases put in with bands around the teeth, exhibiting grotesque attempts at bridge-work. Frequently you will see loose teeth tied with gold strips or gilling twine.

Dr. Brackett.—May I ask Dr. Smith if he applies this principle sometimes in supporting an unbroken row of natural teeth where no artificial substitutes are needed?

Dr. Smith.—It was for this purpose that I first worked out the appliance. I prepare each loose tooth and fit into it a support

after the manner described, and then solder all together, of course putting two of these posts into tight teeth.

Dr. Brackett.—In these cases do you ever grind away very much?

Dr. Smith.—Just the same as in cases with teeth. You have got to destroy the pulps in each tooth, hence there is no objection to cutting away from the lingual face of the tooth as you please to avoid any appearance or feeling of fulness.

Dr. Brackett.—In the advanced cases?

Dr. Smith.—Yes. Why not?

Dr. Meriam.—We notice at the bottom of this a white substance. What cement is it?

Dr. Smith.—Those tubes are filled with gutta-percha. You can fill them with anything you like, with vulcanite, if you wish, and vulcanize them in; but I have used the gutta-percha altogether for that purpose.

Dr. Andrews.—This is back of the teeth?

Dr. Smith.—Yes, in tubes which are formed to represent the lingual faces of the teeth. These tubes are filled with gutta-percha. They may be filled with cement or vulcanite and then vulcanized.

Dr. Werner.—These are Ash's teeth?

Dr. Smith.—The one standing alone is a White tooth, and the other two are Ash's; but I use Ash's teeth almost exclusively.

Dr. Meriam.—We understand you to say you use the Ash tube-teeth?

Dr. Smith.—No, the flat-jack, cross-pin teeth altogether.

Dr. Piper.—Why does the essayist have gutta-percha through here, so much surface in contact with the gum?

Dr. Smith.—That is the way I make all bridge-work. Made in this way it is much lighter, much stronger, less liable to accident, and, best of all, it can be kept in a good state of cleanliness.

On motion, adjourned.

CHARLES H. TAFT, D.M.D.,
Editor American Academy of Dental Science.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held at the office of Dr. R. H. M. Dawbarn, No. 105 West Seventy-fourth Street, New York, on January 4, 1901, the Vice-President, Dr. A. H. Brockway, in the chair.

The minutes of the previous meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

The Chairman.—Doubtless most of us have occasion sometimes to remove amalgam fillings, and this is usually regarded as a difficult and tedious operation. I have been asked to describe a method which I have employed for many years, and which has proved very simple and efficacious. It consists simply in holding a heated instrument on the filling until the heat is felt in the tooth and then at once burring it out before it again becomes cold. It can be cut like cheese. I use for the purpose an instrument having a very slender shank with a bulbous end the size of a pea,—one of the old Woods metal fillers of forty years ago. This is admirably adapted for the purpose, as the slender shank prevents the heat from radiating too rapidly.

Dr. J. Morgan Howe.—Can this method be employed with all kinds of amalgam fillings?

Dr. Brockway.—Possibly palladium or copper amalgam might prove a little refractory, but I am not sure.

Dr. F. Milton Smith.—Since Dr. Locherty, of this Institute, read his paper on the removal of pulps by the use of cocaine and pressure, I have been somewhat relieved in my practice. Dr. Locherty was not the first to suggest the use of cocaine, but he was the first to impress it upon my mind as a matter of practice, and so to Dr. Locherty belongs very much of the credit for the comfort which I am now getting from this method. I am one of the unfortunates who have used arsenic for devitalizing teeth. I understand some men have never used it; but unfortunately several years ago I formed the habit, and somehow I seemed to be tied to it. Quite a number of years ago our esteemed friend, Dr. Gillett, showed us a method, in a clinic, for removing the pulp of teeth with cocaine, using the hypodermic syringe. I was not so successful with that method as I have been with the use of the crystals

of cocaine forced into the pulp-cavity with pressure. Three or four days ago a lady came to me with an exposed pulp in a superior canine. She was in an extremely nervous condition, and it seemed as if she were going to jump out of the chair when I even attempted to dry out the cavity with bibulous paper. After gaining her confidence and adjusting the rubber dam, and after removing the loose *débris* in the cavity and drying it out, I applied crystals of cocaine moistened with carbolic acid. Then, having filled the palatal portion of the cavity with impression-material, I brought pressure upon the pulp by means of a pellet of softened gutta-percha. At first the patient was inclined to jump, but I insisted that she must keep still for a second, when she would have no further occasion to complain. In a few moments I was enabled to remove the pulp absolutely without pain. I speak of this simply to impress upon you that this is not an experiment, but a method of practice. We are too apt when we hear of new methods of this kind to let them go into one ear and out of the other. I think it is three months since Dr. Locherty read his paper before the Institute, and since that time I have used cocaine exclusively and have not used arsenic once for the devitalization of teeth. I wish thus publicly to thank Dr. Locherty for impressing upon me this valuable suggestion.

Dr. H. W. Gillett.—I want to supplement Dr. Brockway's suggestion. The large gutta-percha instrument which comes with the Russell electrical appliances will be found serviceable for the same purpose. I also find it very useful in testing pulp conditions.

Dr. Smith referred to me in connection with the removal of pulps with cocaine. First, I wish to enter a disclaimer as to its being an original method with me. My knowledge of it came through Dr. E. C. Briggs, of Boston. I wish to correct a misapprehension which Dr. Smith seems to be laboring under in regard to the method employed by Dr. Briggs and myself. The hypodermic syringe in this operation is not used in the same manner as in a hypodermic injection. The method differs from that described by Dr. Locherty only in that the pressure is produced by means of the piston of the syringe instead of a pellet of gutta-percha. There is no mechanical crushing of the pulp such as would result if a needle were passed directly into it. Of late I have been using in a large proportion of cases the same process that Dr. Smith mentions. I feel that it is a most objectionable practice to take a pulp

from an anterior tooth by any other means, owing to the better results as regards discoloration.

Dr. Charles O. Kimball.—I was showing one of our members, our honored president, in my office the other day, an instrument which I have used for many years. It interested him, and so I have brought it here to show you. It is not in the market. I made it myself and have used it for thirty years. It is simply a stick-holder, but its superiority lies in its simplicity, the firmness with which the stick is held, and its ease of adjustment. The instrument is used in the cleansing of teeth. After the use of the little disks, brushes, etc., there are always little points which we cannot get at, and it is here that the convenience of this instrument is appreciated. I showed it to "Whites" years ago, but they did not take it up. Grafrath has been making them for my associates for some years.

Dr. C. D. Cook.—Codman & Shurtleff, of Boston, long ago made an instrument similar to this. The piece of wood is held in place by means of a claw clamp, the shaft of which runs through a small handle and is tightened by means of a screw or nut at the end. I have used one of them many years.

Dr. Kimball.—The great advantage of this instrument is that there is no screw, and consequently the readjustment can be effected by one hand. The instrument being held in the middle of the hand, the knob at the end can be moved with the thumb and finger.

Dr. J. Morgan Howe.—I was quite interested in the simplicity of the instrument when Dr. Kimball showed it to me, and I would like to ask Dr. Kimball if he would kindly have a drawing made for an illustration, so that the instrument may be copied.

Dr. S. E. Davenport.—It has recently come to the attention of the Executive Committee that there are a number of Institute members who are not subscribers to the INTERNATIONAL DENTAL JOURNAL. Standing as we do for independent journalism, it hardly seems loyal to our principles not to subscribe to practically the only independent dental journal in existence. Inasmuch as in this journal four very important dental societies report their proceedings,—viz., The Harvard Odontological Society and the American Academy of Dental Science, of Boston, the Academy of Stomatology, of Philadelphia, and our own society, it seems to me that those who do not subscribe are not only lacking in loyalty, but are losing a great deal of valuable reading matter. The members of

the Executive Committee hope that all members who are not subscribers will become so at once, if for no other reason than to enable them to read the proceedings of their own society when they are obliged to be absent from its meetings.

Dr. Howe.—It does not seem necessary for me to emphasize anything which Dr. Davenport has said, but I wish to add any weight I may be able as to the importance of our support of the INTERNATIONAL DENTAL JOURNAL. The societies that publish their reports in the JOURNAL are certainly expected to support it, and I feel that every one here who is not a subscriber should feel it his duty to subscribe at once.

As Dr. Bogue, who was to have given us a talk upon the subject of the International Dental Congress, at Paris, is confined to his bed, he has been kind enough to write for us most of the matter he intended to present, and the secretary will read it for us.

(For Dr. Bogue's paper, see page 218.)

Dr. G. F. Eames.—Experiments and observations on the varying conditions of the saliva and other oral secretions should be of great interest to the dental profession, for I believe that a better understanding of these conditions will give us the key to the proper treatment of many pathological conditions which are the result, not the cause, of a change in the character of the oral secretions. It is my belief that disturbances of the oral fluids may be caused by a local irritant, but I also believe that they more commonly have a constitutional origin. We shall all agree, of course, that a local cause, which produces a local disturbance, may in various ways be communicated to the general system and become constitutional. I regret that I am unable at the present time to speak at length upon this important subject. I can only wish each of you a Happy New Year and much prosperity as a society.

Dr. Gillett.—In regard to the last item mentioned by Dr. Bogue, that of a single support for a bridge, I have been employing that principle for some time past with great satisfaction. The device which I have been using has been described in the dental journals as the Stowell bridge. The idea of a bridge with only one fixed cemented attachment is a most admirable suggestion.

Dr. Platt.—I am very much interested, as we all are, in this line of practice, and while I do not feel competent to speak authoritatively on the subject, I would like some information as to method. I have for some time past felt that we need a change in our mode

of practice. I have had good success with short bridges carrying one or two teeth, with one firm attachment and a lug. I have had one or two failures where the strain has been so great that they have pressed into the gum. I have found that with comparatively long bridges, with two or more attachments, they almost invariably would break loose from all but one of the attachments, and how to overcome this has annoyed me very much.

Dr. J. B. Locherty.—I have done some bridge-work in the past few years, but so far as the “breaking away” of a bridge is concerned, it seems to me that if the roots are strong enough a bridge can be properly made and adjusted which will be firm and satisfactory in every respect. Dr. Gillett’s method I should like to know more about. I have been practising those which have been in vogue for a number of years, but of course in this work we cannot follow any one method; we have to use our own judgment. I have made bridges extending from the cuspid to the second or third molar, placing a gold crown on the molar and a so-called Richmond on the cuspid. I recall one such bridge in the mouth of a patient, a very large man, which made it necessary to make a correspondingly strong bridge. It has been in use some years now, and is in perfect condition. With regard to the apparent sacrificing of teeth, I never hesitate to do so; that is, I never hesitate to remove the pulp and crown of a tooth where I think a permanent and satisfactory bridge can be applied; for I contend that if a pulp is removed and a crown is nicely fitted upon the root, the removal of said pulp will in no way shorten the life of the root, for in many instances a tooth will have a tendency to tighten and become firm after the extraction of a pulp where previously through various causes it was not firm. In adjusting a gold crown or a porcelain crown of the Richmond style a very satisfactory method is to first paint the crown with chloro-percha, then, if the bridge has ever to be removed, it is not so difficult. It seems to me that we have to sacrifice something in order to gain something, and I think the sacrifice is justifiable in many instances.

Dr. G. E. Rice.—Two cases came into my hands during the past year of a similar nature, both bridges with a crown on a molar as one anchorage, a poor first bicuspid root fitted with a band and pin as the other, and a history of continued annoyance on account of the breaking loose of the anterior attachment. In the first case I fitted a pin to the bicuspid root, covered the end of the

root with platinum, soldered pin and platinum base together, and then built up a knob of gold plate and solder. This was cemented in place with oxyphosphate of zinc, and presented much the same appearance as the round top of a brass-headed picture-nail. The under side of the anterior end of the bridge was cupped to fit on this metal surface, forming a half ball-and-socket joint. This bridge has been in place about ten months, and is doing good service. The second case was treated in a similar way five months ago, and is in good condition. It would appear that this method is worthy of consideration for short bridges where a small weak bicuspid root has to be used as one anchorage.

Dr. H. W. Northrup.—In my early experience with bridge-work I used to have a great many break-downs, and gradually learned that my failures were due to a lack of sufficient amount of material to make the work strong. Of course, in this line of work we are not able to judge the amount of strain which the jaw will exert. This difficulty has been overcome entirely by using a sufficient quantity of material, especially solder. I think the heaviest bridges that I ever made were for a physician in this city. They were a full upper and lower bridge, carrying fourteen teeth each. On these two bridges I used thirty-seven pennyweights of solder, besides two or three pennyweights in making the caps and root attachment. The bridges have been in the mouth five years and are giving perfect satisfaction.

Dr. Gillett.—A great deal of our discussion has been along the line of the breaking of the bridge itself. Of course the breaking of a bridge is very troublesome, but it is not this particular point which interests me most. I find such breakage easy enough to prevent, but a rigid bridge often results in loosening of the abutments and irreparable damage. I firmly believe that the principle of one fixed point of attachment, with sufficient support at the other end to withstand the strain of mastication, is going to play an important part in our future work.

Dr. Howe.—We have had a very interesting discussion on this subject of bridges, and also upon the subject of the analysis of the saliva. The latter especially is a very important subject, and I hope Dr. Michaels's experiments will be pursued by others.

Dr. F. Milton Smith.—May I correct what possibly might have seemed to be a reflection on Dr. Gillett's method as shown to us years ago? Whenever I speak extemporaneously I am apt to put

my foot in it. I certainly misunderstood Dr. Gillett's plan, as demonstrated then. I should judge from his suggestions that it is practically the same as the method which I use. I therefore wish to apologize to Dr. Gillett. I have learned so much that is valuable from him that I am the more willing to do so, and also to thank him for the other things which I have learned from him. But regarding bridge-work loosening at one or the other end within a very short time, I must beg to differ with Dr. Gillett. I do not believe this is the case where the bridge is properly applied. If so, why is it that we see so many cases of bridge-work lasting from two to twenty years and with three and even four attachments. There is no question that they do loosen sometimes, this all of us are willing to admit. Is not the trouble here, that we often ask too much of two or three weak teeth? Certainly in most things there are bounds beyond which we cannot go. Another point, which Dr. Northrup has also mentioned, is the fact that often the work is not strong enough. I cannot understand how a person can expect good work from a bridge which has not sufficient strength.

Dr. Northrup.—I would like to mention one case which came to my notice recently which would tend to prove that bridges do not loosen the teeth, but that they are beneficial to them. It was that of a patient with molar, canine, and central on one side of the upper jaw, and a central, lateral, and canine on the other. A bridge connected this molar, canine, and central. All these teeth were affected with pyorrhœa. I had the case under observation for about three years, and noticed that the teeth which supported the bridge were much stronger and firmer than the others and lasted some weeks longer.

Dr. C. F. Allan.—Some months ago I had occasion to remove a bridge of somewhat peculiar construction from the mouth of a patient. This bridge carried only one tooth, a bicuspid. The bite was short, and the man had proved himself capable of breaking anything in the way of porcelain. He had a heavy moustache, and his mouth was already disfigured with anterior restorations in gold, so I had no hesitation in filling the gap with a gold crown attached to crowns on the adjoining teeth. It was simply a hollow dummy open towards the gum, this dummy being filled partially with cement, leaving room, however, for enough pink gutta-percha to make a perfect-fitting saddle resting on the gum. On looking

up my records, I found this bridge had been in position eleven years and six months, and the gutta-percha was still soft and the gum on which the piece rested in a perfectly healthy condition. Since then I have used this plan several times with uniformly good results, and in the exceptional cases, where looks do not count and a strong masticating surface is imperative, it answers admirably.

I would like to say one word in regard to Dr. Bogue's paper. To me the *pièce de resistance*, the paper of all others read at that Congress, was the one by Dr. Michaels. Dr. Black has proved to us that all teeth are pretty much the same histologically, and it goes without saying that if we accept this statement we must look for the reason of caries or immunity from caries in the environment of the teeth. Structure being the same practically in all cases, it must be differing surroundings that make different results.

Now, as if in answer to our reasonable question as to what constitutes the environment making for evil and, as a corollary, the environment making for good, Dr. Michaels comes to us with this paper, showing the results of much investigation and many careful analyses of saliva, and in a measure telling us what this evil environment is. Having, then, almost our first knowledge of those conditions of the secretions of the mouth which we have to guard against, we have something definite to work up to in the way of prophylaxis, and it seems to me this is the entering wedge, promising more for the salvation of teeth and scientific prevention than anything we have hitherto had. These researches stand on the same plane of importance with those of Dr. Miller and Drs. Black and Williams.

Dr. G. A. Mills.—I do not altogether favor sacrificing sound teeth for bridge-work, though I have a case in my own mouth that justifies it in some instances. I had worn various plates to carry a lost superior central incisor, and for this I substituted a piece of bridge-work. Having a sound lateral incisor, I placed upon it a Richmond crown and attached a dummy central, extending a half-round gold wire collar to the cuspid covering the palatal portion. This I have worn with entire comfort for eighteen years without any repairs.

Dr. Eames has said that local conditions are the beginning of constitutional disorders. Appreciating this remark with what Dr. Cook said at Paris relative to the philosophy of disease, it points to something that will lead to direct intelligence and throw light

on such investigations as those of Williams and others in this line of work; also Dr. Michaels's last paper read at Paris, "The Analysis of the Secretions of the Mouth." We predict that these efforts are going to lead us ultimately to valuable conclusions. Dr. Allan has given emphasis to this thought of predisposition and environment, emphasized by Dr. Williams, and we will in the near future have something of fact on which to base a helpful practice. While we cannot destroy the workings of predisposition, we will in no small measure govern it.

Dr. R. H. M. Dawbarn.—I was asked a little while ago if I had anything to say with regard to Dr. Brophy's method of operating in cases of congenital cleft palate. I wish to say that I have never yet had a chance to try it. In the three cases which I have had in the past two years where this operation might be considered indicated it has been rejected by the parents. It seems to them, unfortunately, rather severe treatment of a new-born child. Personally I think it a very good operation, and if the patient were my own child I should be inclined to use it. It is not always easy, however, to persuade parents in these cases. I would like to take this occasion to invite you all to my special clinic at the New York Polyclinic Medical School, on Tuesday, January 8. This clinic is to be for dentists especially. The First and Second District Dental Societies of New York and that of Northern New Jersey having asked me to do this at that time, I shall perform an operation by which I shall endeavor to starve a cancer of tonsil and base of tongue and adjacent alveolus by means of cutting off its blood-supply,—that is, by completely excising the external carotid artery and tying off all its branches. It sounds like very heroic treatment, but it has been successful in a number of cases, and in cases where cutting out the growth is impossible it is all we have left which offers hope in such patients. Of course, there is some anastomosis which will still supply sufficient blood to the normal parts for their nourishment; but the growth itself, which requires an abnormally large blood-supply, does not obtain sufficient blood for it to develop further, and it ceases to increase in size, subsequently shrivelling down to a small lump. It has also been suggested, in addition to this ligation, in order to obtain still more radical cutting off of the blood-supply, that the arteries be injected with melted sterilized paraffin, or with very hot water to cause an obliterating endarteritis. This, Dr. Wyeth's proposal, has not as yet been tried. But

from the plan of double external carotid excision, now performed by me in over thirty instances (and also at my request by various surgeons of this city and Philadelphia, especially), most encouraging results can be reported, in a few cases the operation now dating back about five years, and without recurrence.

Dr. Kimball.—Before adjourning I wish to make a motion of sympathy and thanks to our friend Dr. Bogue, who has, under disadvantageous circumstances, favored us with this paper this evening.

Motion seconded and carried.

Dr. Howe.—Gentlemen, I am sure you will all join me in expressing to Dr. Dawbarn our hearty thanks and appreciation for his kind reception of us this evening, and his interesting talk. I think it is an encouragement to all of us to feel that we have a friend whom we can consult, and whose aid we can seek in surgical work outside of our sphere.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology, of Philadelphia, was held at the rooms of the Academy, 1731 Chestnut Street, on the evening of Tuesday, January 22, 1901, the President, Dr. J. T. Lippencott, in the chair.

A paper was read by Dr. Emma E. Musson, upon the subject "Development of the Maxillary Sinus."

(For Dr. Musson's paper, see page 213.)

DISCUSSION.

Dr. Cryer.—I have been much interested in Dr. Musson's paper, and I endorse what she has said, with a few exceptions. As to the diagnosis of enlarged antrum by observation of the contour of the face, I wish to state that when I heard Dr. Musson speak of this subject once previously, I looked for a skull presenting this characteristic, and having found one, I made a cross-section, expecting to find an enlarged antrum on the side presenting the

greatest enlargement with a small antrum upon the depressed side; but I found the reverse to be true, and that the larger antrum was on the depressed side, and the smaller antrum on the other. Upon examining the thickness of the bones, it was observed that the prominent anterior wall was composed of thick bone, while upon the depressed side the bony tissue was thin. This, of course, is an exception, and, as a rule, you will find the antrum as shown in the illustration.

In the comparative anatomy of the dog and the cat the anterior and middle ethmoidal cells, including the maxillary sinus, seemed to have one common opening, although not so marked as in this illustration before us. There are well-marked cases in human skulls, where a slit-like opening extends from the maxillary sinus through the ethmoidal cells into the frontal sinus.

One of Dr. Musson's illustrations shows the division of the maxillary sinus vertically. In cutting perhaps five hundred or six hundred skulls, I have failed to find an antrum that was completely divided by either bony or membranous septa. A bony or membranous septum may be found, but there is always a communication through this septum. Dr. Musson spoke of the sinus having two openings, one from each division. I have found cases where the posterior one opened into the superior meatus, and in those cases took it for granted that the posterior division belonged to the orbital process of the palate bone, there being a cell in that process. Several skulls were found where this cell had been enlarged, extending downward and backward and curving around the maxillary sinus, and I thought this was a true division of the maxillary sinus, but upon looking for the outlet, I found it to open into the superior meatus. Therefore this is not a division of the maxillary sinus, but an enlarged cell of the orbital process of the palate bone. I am still hoping to find a case of true division of the maxillary sinus.

The doctor passed around a beautiful specimen of the infra-orbital sinus. I entered into a description of this at the American Dental Association in 1895, and spoke of a case in which the sinus was enlarged, and where the nerve, instead of passing out through the solid bone, passed downward, forward and across the anterior superior corner of the antrum.

It has been a great pleasure to have Dr. Musson with us this evening, and her paper has been most instructive and interesting.

Dr. Schamberg.—I wish to state my appreciation of the paper, inasmuch as the doctor has given us means of recognizing pathological conditions of the antrum during life. We can easily find these conditions on post-mortem sections, but it is highly important that some one endeavor to make clear to us how we are to recognize these various conditions during life, and I must say the paper this evening goes a little farther in this direction than any that I have ever heard. There are few things which are of more decided advantage to us as dentists than an understanding of the proper point at which to open the antrum in diseases of that cavity. I must take exception to the opening through the roof of the mouth, inasmuch as the tongue would tend to force food up through the opening, and therefore I would prefer to enter the antrum through the anterior wall. It is highly essential to remember that a small opening into the antrum is of little advantage. You so frequently find conditions in the antrum that cannot be cured by syringing alone. The antrum often requires curettage. I had a case a few months ago where I expected to find a discharge of pus, but upon opening the antrum this did not prove to be the case. A few days afterwards, however, I got a considerable discharge of pus, and there was evidently an abscess on the superior part of the anterior wall, and this illustrates the fact that it is highly essential to have a large opening, and a large opening in the roof of the mouth would interfere considerably with deglutition.

Dr. Curry.—Dr. Musson spoke of resorption of the bone, and I wish to state that I once had a patient, about seventy years of age, who had no teeth posterior to the cuspids, and who complained of a great deal of pain in the antral region. I passed a bistoury through the gum, and it dropped directly into the antrum without any resistance; there did not appear to be any bone whatever. I will ask Dr. Musson if she has ever noticed that degree of resorption in any of her cases.

Dr. Musson.—With regard to Dr. Cryer's remark that the bulging of the bone could not be considered indicative of enlargement of the antrum, we would, of course, be aided in our diagnosis by the transillumination test.

As to the cell in the orbital process of the palate bone, I would consider that as a prolongation of the antrum. I know these cells do sometimes exist, and if I should find an apparent division of

the antrum opening into the superior meatus, I should call that an ethmoidal cell, and not a true division of the antrum. After all, these sinuses are a continuation of cells, and are named according to the region in which they are found. It is almost impossible in some of my specimens to tell the difference between the ethmoidal cells and the sphenoidal cavity.

As to Dr. Schamberg's remark in regard to opening the antrum, I did not recommend opening through the roof of the month, I merely said it was possible. A very large opening into the antrum is needed in order to treat it properly, and I almost always operate in the canine fossa, unless, indeed, the first or second molar is gone, when I open up through that alveolar process. If I suspect a condition of caries, I have the tooth removed and open up through its alveolus. With regard to the case Dr. Schamberg mentions, in which he obtained no discharge of pus on opening the antrum, the discharge occurring a few days later, I have explained these cases by the fact that the secretion is inspissated, dry, and adherent, but after two or three days you get a marked purulent secretion due to the dislodgement of old dried secretions. In operating where we have growths, I believe the Caldwell-Lue operation is the best. An opening is made through the canine fossa and one through the inferior meatus. That in the canine fossa is later closed and the opening into the inferior meatus left open for drainage. This gives the best results where we desire curettage and where there are polypoid growths.

As to absorption of the antral floor occurring to such an extent as to leave no process between the root of the teeth and the antrum itself, in a case of this kind I should be inclined to think that when the teeth were removed, the floor of the antrum came away with them.

Dr. Kirk.—As this seems to be the evening for consideration of surgical matters, I would like to get opinions relative to operation in cases of abnormal protrusion of the lower jaw, where a resection is made, taking from the jaw on each side a V-shaped section and resetting the jaw in a normal position, as described first by Hullihen, of Virginia, and recently by Whipple, of St. Louis. Quite recently there have been sent to me models of a case where protrusion or abnormal growth forward of the lower jaw has taken place, making a very ugly deformity which the patient desires to have corrected, a case which I should say was

intractable so far as any ordinary method of mechanical treatment is concerned, especially at the age of the patient. The point I desire to raise is whether, in an operation of this kind, involving a complete section through the body of the bone and removal of a large portion of it, involving a section of the nutrient vessels and nervous connections of the teeth, it would not necessarily destroy the nervous and nutrient supply of the teeth anterior to the section? Or, to put it in another way, what are the chances for a restoration of the nervous and vascular relationships of the teeth anterior to the field of operation? I ask for information, so that I may give advice to the man who asks the question.

Dr. Cryer.—About four months ago Dr. Roberts asked my opinion of an operation of this kind, and I told him I would like to see such an operation, but did not care to undertake one. A young man who has been going the rounds of surgeons wishing such an operation to be done finally reached me. I told the boy I would not undertake the operation under any consideration. My answer to Dr. Kirk is that I would not operate for a condition of this kind. It is only undertaken to improve the appearance, and there is little in the appearance of a man. If he accomplishes something in life, his appearance will not be thought of.

The teeth anterior to the section would, I believe, lose their sensation through severance from the source of nervous energy, but with regard to the nourishment I am not so certain. If the operation were performed carefully there would be a collateral circulation sufficient to preserve the life of the teeth. The teeth would not respond to heat or cold, but it is not necessary that the pulps should die. Surgeons are constantly making resections of the inferior dental nerve between the foramen ovale and the inferior dental canal, and the nerve has been removed along the greater portion of the canal, yet the teeth have not lost their vitality, and therefore I believe that in an operation such as Dr. Kirk questions, the vitality of the teeth would not be destroyed. Perhaps the nerve might regenerate, and even sensation be restored. My chief objection to the operation is the great risk of infection and necrosis of the bone.

Dr. Kirk.—I think Dr. Cryer has made out a pretty good case in favor of this operation, after all. He objects to it on general principles, and yet, as a matter of fact, he says he thinks the circulation can be re-established by collateral circulation, and that even a re-

establishment of nervous supply is possible. Why, then, should he take the ground that the operation should not be done? I know nothing about it practically, but ask for information.

Dr. Cryer.—We sometimes find, in the simple extraction of a tooth, that there will be a separation of the jaw, leading to great deformity and bad consequences. Now, when you come to take a V-shaped piece out of each side of the jaw, it is a very nice operation to cut these pieces out alike on both sides. I do not care what instrument you use. Experiment upon the cadaver, and see how difficult it is to get perfect apposition of the cut surfaces. Some time since we had a case of pathological separation of the lower jaw, where the inferior dental nerve and vessels and a great portion of the bone, extending from the second molar to the canine tooth, were destroyed; but by the ingenuity of Dr. Gaylord a bridge was made, extending from the second and third molars forward, capping all the anterior teeth and uniting the parts; the necrosed bone was cut away with a surgical engine. That splint or bridge remained on from June until the following January. The parts are now united with true bone, no depression being evident on the outer, inner, or lateral surfaces. On the upper surface, however, the alveolar processes are lacking, and will never be reproduced. The sensation is already returning to the lip and other tissue anterior to the injured part. Remember that this case was on one side only, and that there was a chance to hold the parts in their true position, and that the periosteum was only partly removed. As for cutting through both sides, I would not want to undertake it. Perhaps I am getting too old for an operation of this kind, and some of the younger men who have not seen quite so much surgery in that locality would undertake it.

Dr. Schamberg.—I wish to suggest an operation which I think would take the place of the one Dr. Kirk has mentioned, and that is, instead of taking out a V-shaped piece, to make a median section through the symphysis, so bevelling the edges that when brought together there will be a retraction of the anterior portion of the jaw, sacrificing, if need be, the central incisors. This would likely require spreading of the posterior portion of the jaw in order to get retraction of the anterior part. We would necessarily have to change the occlusion in the first operation, and I imagine the occlusion in a jaw of that kind is anything but perfect.

Dr. Kirk.—With regard to the point Dr. Cryer has raised,—namely, the great difficulty in making the section so as to get perfect apposition of the cut ends of the bone, I would call attention to the fact that in the cases that have been operated upon it was done by using parallel saws and cutting so that the surfaces were exactly adaptable. A very rigid means of fixation was then applied, and firm union was secured in ten days.

Dr. Cryer.—Mr. President, I would like to move that a vote of thanks be extended to Dr. Musson for her paper this evening.

Carried.

Adjourned.

OTTO E. INGLIS, D.D.S.,
Editor Academy of Stomatology.

Editorial.

IS DENTISTRY OVERCROWDED?

THE approach of the commencement period naturally turns the thoughts of those who expect to graduate in dentistry to the subject of where to locate. To the minority, who expect to follow in the footsteps of their fathers who have preceded them in the profession this may not be important, but to the large majority it is not only a serious problem, but a source of anxiety to themselves and to those directly interested in their future welfare. Possibly no class is more deeply interested in this than those who have the training of these young men. The teachers feel that they are in large degree responsible for the success or non-success of the student, and would gladly point out the way to overcome at least a portion of the initial struggle which is a part of the experience of every young life. While wealth may change the character of that struggle, there is always something to be overcome, something to be learned, something which money cannot buy, which must be ingathered whether it be for good or evil, for the advancement of the man to higher things or for his debasement.

The strenuous character of our every-day life, the competitions and the increasing difficulty of securing more than a mere living

in the various subordinate positions, is rapidly tending to a condition of affairs the despair of the political economist. The hopelessness of ever securing an independent position in the ordinary occupations of men is fast driving young men of limited means into the professions. This tendency has long since been noted, and it is to this that is largely due the counter-efforts of those already in the professional ranks to drive back the ever-increasing flood. To effect this all sorts of legal obstructions have been placed in the way of the young graduate. These legal forms have another meaning to the member of a State board, or, at least, he tries to convince himself that he is working for the elevation of his profession, and some may even succeed in forcing themselves to believe it, but underlying all this effort is the one paramount feeling that the profession is already overcrowded and the new men are not wanted. And further than that, the colleges are doing a great wrong in that they fail to discourage young men from taking up the study of dentistry.

This question of overcrowding has been incidentally alluded to heretofore in these editorial pages, but a more extended examination of the subject seems not only important at this period, but absolutely necessary, that this ever-recurring charge be met with facts from reliable sources, that demonstrate beyond mere words that this country is not only not overcrowded with dentists, but cannot possibly reach that condition for many years in the future.

It must be clear to all minds that overcrowding means more dentists than the population will support. If, then, it can be shown that the number of dentists bears no proportion to the number that could be comfortably supported, the senseless cry should not be heard for some generations to come.

The writer has endeavored to meet this demand by comparing the number of dentists with population in several of our large cities, smaller towns, and villages, and the possible number that may be claimed as rightfully belonging to the practitioner, or from which he may expect to secure a clientele.

Beginning with New York City, and taking the number of dentists from Polk's *Dental Register* and the population from recent census returns, it is shown that with a population of 3,437,202, New York City contains 1143 dentists. This means New York City proper, Brooklyn, and adjacent boroughs. This gives one dentist to 3007 people.

Chicago has a population of 1,698,575. Number of dentists 1025, or one dentist to 1657 people.

Philadelphia, the third city in size, with a population of 1,293,697, has 664 dentists, or one dentist to 1948 persons. This city has probably 1400 dental students who may properly be regarded as practitioners. This number added to 664 equals 2064, or one dentist to 627.

This may be applied, with proportionate degree, to all cities having dental colleges. The writer has, however, not considered it in those cities most deeply affected,—Chicago, New York, Boston, Baltimore, and Cincinnati.

Boston has 560,892 inhabitants and 462 dentists, or one to 1214 people.

Baltimore numbers 508,957, with 254 dentists, or one to 2004.

Cincinnati has 325,902 people and 217 dentists, or one to 1502.

Richmond, Va., has a population of 85,050, with 51 dentists, or one dentist to 1667.

New Orleans, with a population of 287,104, has 119 dentists, or one dentist to 2412.

Omaha, Neb., numbers 102,555, with 55 dentists, or one dentist to 1864.

Kansas City, Mo., has 163,752, with 155 dentists, or one to 1057.

San Francisco, with a population numbering 342,742, has 425 dentists, or one to 806.

Portland, Me., with 90,426 people, supports 68 dentists, or one to 1335.

Minneapolis, with 202,718, has 100 dentists, or one dentist to 2027.

Albany, N. Y., has a population of 94,151, with 35 dentists, or one to 2690.

In the smaller towns, numbering some 25,000 people, two are selected: New Britain, Conn., population 25,998, with 9 dentists, or one dentist to 2888. Cedar Rapids, Iowa, population 25,656, with 22 dentists, or one to 1166.

Villages support rather more than their share of the dental fraternity. Pen Yan, N. Y., with a population of 5050, has 5 dentists, or one to 1010 people. Griffin, Ga., with a population of 5000, has 6 dentists, or one to 833.

To arrive at some definite conclusion in regard to the value of

these statistics, it must be borne in mind that the maximum number of patients that can properly be waited upon per day of eight hours will not exceed six. This does not include examination cases. This will give eighteen hundred for a year of three hundred working days. It must be remembered, however, that each patient will require several sittings, and averaging this at four for a person, it will make 450 as the actual clientele of the dentist. If this be made, in round numbers, 500, and allow 30,000 dentists for the United States (Polk makes it 26,500), there will be 15,000,000 people treated in dental offices yearly. The population of the entire country is 76,000,000, which leaves 61,000,000 unprovided with dental aid. Making due allowance for the poorer classes, blacks, and Indians, there will still be a large population, probably at least 30,000,000, that should require the services of the dental profession.

It will be observed, in analyzing the figures previously given, that not one of the larger cities is as yet overcrowded, not even Philadelphia, which comes the nearest to the minimum limit.

Some of the results of this examination present peculiar features. For instance, New York City would seem, with its one dentist to three thousand inhabitants, to be a remarkably good locality for a young man to settle in. It must, however, be remembered that New York has a very large foreign population, and perhaps more than any other city of that kind of population that gives no attention to sanitary conditions, and least of all to the care of the oral cavity. On the other hand, the attractions of a great metropolis draw people from all sections of the country and the world, thus largely increasing the possible number to draw upon.

San Francisco would seem, with its one dentist to eight hundred and six people, to be very much overcrowded as compared with other cities, and yet it has not reached the minimum previously stated.

With this single exception there is no city in this country where the young dentist need to hesitate in regard to settlement. There is apparently room for more everywhere.

The present April will find a large number who will pass out from the dental colleges of the United States and Canada. Before these come to any decision upon the locality in which to settle they should carefully study the statistics as given in the *Dental Register*, to which reference has been made. While this directory may not

be absolutely correct, it is the nearest to reaching that desirable result of any heretofore published, and it will give a very definite idea of future possibilities for the young practitioner.

The graduate should take time, months if necessary, and having selected a favorable location, settle and *remain*. Unless capital is abundant, avoid all large cities. The struggle is here too severe without good financial support to enable the beginner to wait for the practice that will come in time.

THE ARMY EXAMINING BOARD.

THIS board has organized at Washington with Dr. John S. Marshall as president, and upon another page will be found an announcement which came too late for the March number, but will serve a purpose by giving the dental profession an idea of the methods proposed to be adopted by the board in the examination of applicants for positions. While these examinations are, at this writing, March 8, fully under way, it is presumed that many who would gladly accept the opportunity have not been made aware of the fact. If any public notice has been made by said board of the proposed examinations, it has escaped the observation of the writer. The twenty-seven men to be appointed will have a serious task before them, for to these belongs the duty of proving to the critical military authorities that all that has been said of the value of dentistry to the army is absolutely true. The general dental profession will also watch their work critically, and if they fail to measure up to a high standard, it will mean a serious disappointment; and not only that, but it will lower the entire dental profession in the estimation of those whose good opinion is most to be valued.

The men in dentistry have never asked that Congress should pass this bill from selfish motives. It was affirmed, and was well supported by evidence, that the army was suffering from lack of just the aid that well-trained dentists could give, and it was for the benefit of the men that the bill was finally adopted and received the signature of the President.

In the March number a brief allusion was made to the selection of the men to compose the examining board. These three appoint-

ments leave but twenty-seven men to be selected to serve as contract dental surgeons. It is supposed the army will be recruited up to the maximum number,—that is, one hundred thousand. This will give a clientele of four thousand men to each dental surgeon. This of itself is sure to result in failure. No man living can perform dental work properly for that number. If he were to work eight hours a day, Sundays included, he would have waited on something over four thousand in a year and a half; that is, operating only once for a single individual.

The bill, as passed, is absurd, but it was something to get one through, and it is possible to have it amended in the future, when an effort should be made to secure two dental surgeons to a regiment; or, if that be not possible, at least one for a thousand men.

The bill in its present shape, and the appointments made under it, have been a serious disappointment to those who have labored for years to accomplish its passage. The great desire of the best class of dentists was that the highest type of men should receive the initial appointments. It was further hoped that politics would be eliminated, at least for the time being.

The effort was made throughout the United States to present only the best representative men that could be found willing to accept the chief positions. It was naturally feared that it would be difficult to find that character of men willing to serve on the meagre salary provided in the bill. It was well understood that whoever did elect to represent the dental profession in the army, it would be at great pecuniary sacrifice as well as comfort. It was, therefore, something of a surprise that a number of men known to be well qualified offered their services, and the dentists of the country were not slow to appreciate the fact that this sacrifice was worthy of the men, and, recognizing this, they received cordial endorsement from all sections. It was supposed that the heads of the government appreciated the full measure of responsibility devolving on their selections, and in making these appointments only the highest good of the army would be taken into consideration.

The blow came when it was officially announced that three had been appointed. One man of the three required no endorsement. He was known everywhere as fully equal to all demands; some few knew another by name, but the other was by the writer entirely unknown. This latter appointment cannot be regarded complacently, as it is felt to be entirely at variance with the wishes of

the entire dental fraternity that only men well known should fill these important positions.

The dental profession expected, nay, more, practically demanded, that Dr. Williams Donnally, of Washington, should be a member of this board. Throughout the long and vexatious period in which the several bills presented to Congress were from time to time held up he was ever the earnest and faithful worker, spending liberally of his own means and time that the dental profession might not be disappointed at last. He knew that the National Dental Association would hold him largely responsible for the success or failure of this measure. He met the responsibility with a courage and persistency that have throughout this trying period claimed the admiration of the writer. It was well known that this work of Dr. Donnally was truly unselfish. He had an ambition, an honorable one, to help inaugurate this movement and place it upon a permanent basis, and the dental profession felt that this desire was worthy of the man, and did not for a moment anticipate that the appointing power would select any one who failed to represent the dentistry of the United States.

The reason said to have been given for thus casting Dr. Donnally outside the pale of appointments may have force with the party originating it, but to the writer it seems unworthy an officer of the government. The opinion was, simply, "That no one who had been influential in securing legislation should personally profit by the legislation when enacted."

This, of course, made Dr. Donnally's appointment an impossibility. There was no objection, apparently, to men who had worked for *themselves* and had labored hard to secure all the political influence possible, both at Washington and elsewhere.

If men could be selected to fill these and other important positions because of their marked ability, a course pursued by all well-regulated corporations, there would be a very different story told throughout this "boss"-ridden country.

The writer is well aware that Dr. Donnally would be the very last man to desire his personal feelings ventilated upon the pages of a public journal, but it is felt he must add this sacrifice to those he has previously made for his profession, in order that the dentists of the country may understand the situation. It is the most lamentable ending of an heroic struggle that dentistry has known in many years.

This profession owes much to another man, not within its borders, Surgeon-General George M. Sternberg, who has from the first fully appreciated the importance of having the right man in the right place; and while his powerful influence has been exerted on behalf of the bill, and without it it probably could not have been passed, he necessarily had no prominent part in the appointments. His name is, therefore, merely mentioned to voice the grateful feeling the writer is well aware exists.

The thanks of the dental profession should be gratefully tendered to Senator Edward W. Pettus, of Alabama, the father of the bill in the Senate, and to Hon. P. J. Otey for his great work in the House. This labor was given unselfishly, and the National Dental Association should, at its next meeting in August, remember these facts and act accordingly.

It is a great satisfaction to feel that the presidency of the board of examiners is centred in Dr. Marshall, of Chicago. There is a confidence felt in his ability that will go far to minimize the disappointment alluded to, but it cannot dissipate the unpleasant feeling existing.

In the opinion of the writer a concerted action should be had during the sessions of the National Dental Association, if not before, to protest against any appointments upon mere political recommendation. These should follow upon examination made by a temporary commission. The government could well afford to set an example in this respect to the several States, where political influence is fast destroying all respect for State boards. Further than this, it does seem that an immediate protest should go to the appointing power, and, if necessary, to the President, asking that all future selections be made upon the endorsement of the national organization.

It is presumed it is too late to attempt anything on behalf of the one man the dentists of the country desired on that board, but something of value may be done in this direction in the near future if proper efforts be made.

The responsibility of failure of this effort to establish dental operations in the army should be placed where it properly belongs,—upon the shoulders of Congress. This body has made its success almost an impossibility. It is probable that this result was not intended, for the average layman has but a limited conception of the value of dental services, and especially so where the men in

the army are concerned. All that is usually expected of dentists in such positions is to extract teeth and "stop toothache." The pathological conditions that so militate against efficient service are rarely, if ever, considered in connection with dental work.

There is no desire to be a prophet of ill-omen in this connection, but it does seem to the writer that the non-success of this experiment is fully assured under present arrangements. The men selected, however able or earnest, cannot fulfil the duties required of them. When this is demonstrated and a demand is made in Congress for the repeal of the act creating contract dental surgeons, let the blame for the failure rest on Congress, and not upon dentistry or upon the men who so faithfully worked until the act creating dental surgeons in the army was finally passed.

THE GRADUATING CLASSES OF 1901.

THE period for graduation at the various dental schools having a seven-months' course has arrived, and a large body of young men will pass out into the great world of activities to practise the profession it has cost them three years of time and much outlay of money to secure.

The most important question that can engage the graduate's attention, after location has been secured and a permanent settlement made, is that of association with his fellows in professional work. Any life is proportionately barren if it seeks the cloister of self-isolation. The dental profession is not only an active one, but it demands constant association. Its rapid growth has been largely the result of this associated effort, and no one can fully reach development who fails to become a part of dental organizations.

In connection with this, and hardly second in importance, is the constant and close connection with dental literature. A dentist must be a reader if he would aim to keep step with the almost hourly progress of his calling. He cannot be intelligent without the knowledge thus acquired, for all that he may have absorbed in his college course will soon grow indistinct in his memory unless constantly freshened by new inspirations from periodical literature.

There is another point of equal importance, and that is the cul-

tivation of a moral standard, avoiding those non-ethical things that so frequently mar the truly professional spirit. There is a great need for more of this personal care. It should be manifested in all the relations of active life. Young practitioners should seek those avenues of information that are entirely clear of outside entanglements, and one of these is the truly professional journal.

This number and the May issue of the INTERNATIONAL DENTAL JOURNAL will be sent to some of the graduating classes of several dental colleges. This is a journal strictly devoted to professional interests, having no direct alliance with the ordinary business world. It is published by a company of dentists exclusively for dentists, and at present is the only distinct representative of the dental profession in the United States. A journal thus constituted should appeal to all graduates, as it constitutes in degree a post-graduate training in those ethical standards that was theirs to receive during their college life.

The sample numbers sent constitute, as it were, the advance thought that is supposed to lead more directly to the period of assured interest in dentistry as a daily practice. This only can come in months and years, but when it has arrived, the earnest practitioner avoids all dubious paths that lead beyond the borders of professional life.

The young men of this present graduating period, and those who succeed them from the colleges having longer courses, are cordially welcomed into the dental profession, and they can be assured there is room for all who have worthily labored through their preliminary training and are ready to meet all demands of the general public in moral excellence and practical ability.

AN ADDITIONAL COLLABORATOR.

It will be observed that Dr. William Leon Ellerbeck has been appointed a collaborator to this journal. His contributions will be reviews of papers upon chemical and metallurgical subjects pertinent to dentistry; with the ultimate intention to include those upon bacteriology.

THE INTERNATIONAL DENTAL PUBLISHING COMPANY.

Bibliography.

PATHOLOGY OF THE TEETH. By Carl Wedl. Second Revised Edition. Edited by Drs. Joseph Ritter von Metnitz and Gustav Ritter von Wunschheim. Vol. I. Published by Arthur Felix, of Leipzig.¹

The first edition of Wedl's Pathology was published in 1870, and was translated into English in 1872 by W. E. Boardman, M.D., of Boston. It has during these years been held to be a standard work upon the subjects treated,—namely, the anatomy, physiology, and pathology of the teeth.

The second edition, while containing all that appeared in the first edition, has much that is new both in text and in illustration. In order to give an idea of the scope of the work a brief review of the subjects treated is appended:

Anatomical Division.—(1) The Oral Cavity; (2) The Superior Maxillary Bone; (3) The Inferior Maxillary Bone; (4) The Joint of the Inferior Maxillary Bone.

Under the general heading of The Teeth is to be found a description of the teeth in their general characteristics and a minute description of each tooth, both of the temporary and permanent set. Then follows a minute description of tooth dentine, enamel, cement, the dental pulp, and the gingiva. A good deal of space is devoted to the development of the teeth and the jaws, and histological considerations are naturally prominent. Much new material is here introduced, both in form of text and of plates.

The anatomical division is concluded by a chapter on the growth of the jaws.

The *Pathological Division* is opened by a consideration of Anomalies in Tooth Formation, and the subdivisions are, (1) Anomalies in Size; (2) Anomalies in Number; (3) Anomalies in Position; (4) Anomalies of Construction.

¹ Carl Wedl's Pathologie der Zähne. Zweite umgearbeitete Auflage. Herausgegeben von Dr. med. Univ. Joseph Ritter von Metnitz und Dr. med. Univ. Gustav Ritter von Wunschheim. Band I. Verlag von Arthur Felix, Leipzig.

The final chapter is devoted to misformations of the teeth or odontomes.

The first book of the second edition covers about one-third of the complete work and contains about thirty-five pages of new material. The new material adds much to the completeness of the work. It consists, in part, of quotations from leading German and Austrian dental periodicals; in part, of quotations from standard books, as those written upon oral subjects by Professor Zuckerkandl, of the University of Vienna; and in part, in the citation of cases which have appeared in the medical clinics of the University of Vienna. In addition, the editors have been free to add new material of their own, and to rearrange the old material. A successful attempt has been made to freshen up and bring down to date a treatise which, even in its original edition, is to-day a book of great value as a text- and reference-book.

As one example of the orderly and thorough arrangement of the material, I will quote from the section describing the influence of hereditary syphilis upon the teeth.

"Fournier draws attention to the following peculiarities (of syphilitic teeth) :

"1. The tooth notch is almost always ground away obliquely at the expense of its forward border.

"2. The tooth has rounded corners.

"3. The vertical length of the tooth is shortened.

"4. The tooth is at times very narrow.

"5. The tooth has the form of a screw-driver; that is, it is thick and broad at its neck and narrowed at its free end.

"6. The long axes of the upper central incisors often converge.

"A further important consideration is that the Hutchinson tooth from youth on changes its form and entirely loses the characteristic notch. At twenty-five years there remains only a slight trace of the lesion in the form of a narrow oblique surface at the forward side of the cutting border. Over thirty years of age there are no longer Hutchinson teeth."

It is to be hoped that in due time this edition will be translated into English, so as to make it available for those who do not read the original.—WILLIAM H. POTTER, D.M.D., Boston.

Domestic Correspondence.

CIRCULAR FROM THE WAR DEPARTMENT.

WAR DEPARTMENT, SURGEON-GENERAL'S OFFICE,
WASHINGTON, March 16, 1901.

TO THE EDITOR:

SIR,—By permission of the Surgeon-General, I have the honor to inform you that the following-named gentlemen have successfully passed the examination before this board, and have received their appointments as Contract Dental Surgeons, United States Army:

Siebert Davis Boak, graduate of National University, Dental Department, Washington, D. C., of Martinsburg, W. Va.

Edward Clarence Lauderdale, graduate of University of Buffalo, Dental Department, Buffalo, N. Y., of Naples, N. Y.

These gentlemen have been ordered to report for duty at San Francisco, Cal., April 15, for service in the Philippines.

At the present writing there have been fourteen gentlemen ordered before this board by the Surgeon-General for examination. Only two, as you see by the above report, have successfully passed the examination. The board has been disappointed in the professional qualifications of most of the young men who have presented themselves. The examination does not cover any subjects which have not been taught in our best dental schools, and the board believes that the questions submitted in the examinations have been of a practical nature, and eminently fair. It is to be hoped, therefore, that our dental schools will not recommend any young men to come before this board who are not thoroughly well qualified, theoretically and practically, in all of the branches comprising the curriculum of our best dental schools.

It will be the pleasure of the Examining Board of Dental Surgeons to keep the profession posted as to its work through the various dental journals.

Kindly acknowledge receipt, and oblige,

Very respectfully,

JOHN S. MARSHALL,

President Examining Board of Dental Surgeons, United States Army.

OPEN LETTER TO DR. FRED. L. BOGUE, EDITOR THE
NEW YORK INSTITUTE OF STOMATOLOGY.

DEAR SIR,—I find in the INTERNATIONAL DENTAL JOURNAL, February issue, 1901, page 103, Report of Society Meetings, November 9, 1900, mention made by Dr. George H. Maxfield, of Holyoke, Mass., with very strong endorsement, which I am glad to see, of the practice (presumably new, but of many years' growth) of tin fillings capped with gold by Dr. T. D. Shumway, of Plymouth, Mass. I write to inform you that the same line of practice, except the use of Ivory pluggers, has been that of some dentists many years (more than thirty), and mention of the practice and recommendation of it has been made in dental journals, and there has been considerable correspondence and instruction imparted on the subject.

Dr. E. K. Wedelstaedt, of St. Paul, Minn., indulged the practice of tin base and gold capping some years ago, and doubtless can impart intelligent and profitable information of experience and results pertaining to that particular mode of practice. I recollect corresponding with him some years ago in an effort to secure knowledge of the make (form) of tin he used in such work.

Teeth to my own knowledge that were filled in that way more than twenty years ago are now doing good service.

There may be special virtue in Ivory pluggers, and, with the use of them in manipulating the combination, results may be secured that cannot be with steel pluggers and burnishers, but I cannot see it, and I question if any one else can.

A cavity filled two-thirds, three-fourths, or four-fifths with tin and capped with gold is good practice. The operation of filling is more easily executed with less discomfort and tax upon nerves of patients, and is more tooth-preserving, and is unquestionably a more conservative and progressive practice than the *old-rut, one-idea practice* of all gold from base to finish or nothing.

My experience of many years in the practice of tin base and gold capping enables me to speak favorably of the combination. Results entirely satisfactory justify the assumption that it is a line of practice in which practical instruction should be liberally dispensed in dental colleges.

B. F. ARRINGTON.

GOLDSBORO, N. C.

Miscellany.

A BANDED LOGAN CROWN.—In this method of banding the Logan crown, the root is prepared as for a Richmond crown. The root-canal is enlarged and shaped to receive the pin of a Logan crown properly, using such a pin to determine the shape and fit. Make the band and cap and solder together as usual. Punch an oblong hole in the cap so as to receive the pin of the Logan crown. Place the cap and band in position on the root and insert an orange-wood peg in the canal similar in size and shape to the Logan crown pin, but fitting loosely so as to come away with the impression. Take an impression and bite all in one in plaster of Paris. Run the models and articulate in plaster. Withdraw the wooden peg. Select a Logan crown to suit the case, and with a carborundum or gem stone grind dry to articulate and also to form a close joint with the cap. Carbon paper can be used to determine high places in grinding. Then take a piece of thin platinum-foil and make cuts in it the shape of the capital letter I to receive the pin of the crown. Pass this over the pin and burnish down over the cervical end of the crown. This should lap over on the sides of the crown about one-sixteenth of an inch. Fasten the crown on the cap with hard wax or Parr's fluxed wax. Cut away the plaster and remove from the model. Invest crown downward and place a few pieces of solder around the pin and solder. This makes a crown with perfectly closed joints, and for naturalness, strength, and appearance is superior to a Richmond.

The crown may be cemented to the cap and then removed from the model, finished, and set without soldering.—McCLAIN.

GOLD BLINDNESS, OR RETINAL ASTHENOPIA, AND ITS TREATMENT.—In gold blindness, the power to distinguish the gold from the walls of the tooth is lost after working a short time. This is caused by an overstimulation of the retina by the yellow rays of the gold. Exhaustion follows, and a scotoma, or blind spot, results, just as the refulgent rays of the sun will cause blindness by excessive stimulation. Looking at fused gold for a short time will

produce similar results. All this work should be done only under the protection of properly tinted glasses.—DR. L. WEBSTER FOX, *Dental Cosmos*.

[After reading the excellent paper by Dr. Fox, the writer recalled the fact that he suffered from gold blindness while a student. All the above phenomena were experienced. The discovery was made that it was caused by getting the face too close to the work. This overtaxes the muscles, which results in the loss of the power of accommodation. A careful avoidance of close vision brought about a complete cure without glasses. Upon investigating this trouble among the students in the clinic in the University of Pennsylvania it is found to be quite common, and the same precaution which corrected the affliction in my own case corrects it in them, so far without exception.]

INLAYS.—M. Chaupin demonstrated “inlays” in a slightly different method from any other at the International Dental Congress of 1900. The cavity was on the mesial surface of an upper right lateral. The teeth had been well separated. A piece of platinum-foil, large enough to cover the labial and palatine surfaces, and extending some distance below the incisive edge of the tooth, was pressed into the cavity in the usual way, and then folded over the lingual and labial surfaces and pinched together over the cutting edge of the tooth.

The larger piece of foil gives a great amount of stability to the whole matrix and there is not the same liability to disturb the matrix. The surface of the foil was painted over with a thin mixture of whiting and water up to the edges of the impression of the cavity. The reason for this is obvious and a good one. The inlay was fused over a gas blow-pipe, and the result was very good.—DR. T. MANSELL, *Dental Record*.

FORMALDEHYDE GAS FOR DISINFECTING BOOKS IN LIBRARIES.—For some time the belief has been current, doubtless not without good foundation, that diseases have been contracted by handling books in public libraries, which have become infected with the germs of some disease.

The New Jersey authorities have been the first to take preventive measures, because a case of scarlet fever had been shown to be transmitted by the agency of a book in a travelling library. Professor Mitchell, of the State Board of Health, has been conducting a number of experiments with formaldehyde gas on kindergarten toys and public school-books. So far it has been found the surest destroyer of microbes. It works quickly and effectively. This much has been demonstrated to the satisfaction of the experimenters, but the experiments are continued to discover the least amount of the gas that can be safely used, not only to kill the germs, but to make the books germ-proof, at least for a time.—*Medical Record*.

TO FINISH ALUMINUM PLATES.—At a clinic given at the recent meeting of the State Association at Louisiana, Mo., Dr. W. W. Flora, of Carthage, Mo., gave a demonstration on the use of caustic soda on aluminum. He uses a twenty-five per cent. solution on the cases after vulcanizing and finishing them. This gives a most beautiful finish and one that is pleasant to the sense of touch.—*Western Dental Journal*.

Current News.

COMMUNICATIONS FROM THE FOREIGN RELATIONS COMMITTEE.

DEPARTMENT OF STATE,
WASHINGTON, February 6, 1901.

W. C. BARRETT, ESQ.,

Chairman Committee on Foreign Relations of the National Association of Dental Faculties, 208 Franklin Street, Buffalo, N. Y.:

SIR,—At the suggestion of the Consul at Munich, I enclose for your information copy of a despatch from the Consul in regard to American dental degrees in Germany, and the efforts which are

being made to prevent those who hold fraudulent diplomas from practising dentistry.

I am, sir, your obedient servant,
(Signed) THOS. W. CRILLER,
Third Assistant Secretary.

(Copy.)

No. 38.

CONSULATE OF THE UNITED STATES OF AMERICA,
MUNICH, GERMANY, December 29, 1900.

HONORABLE DAVID J. HILL, etc., etc., etc.:

SIR.—Referring most respectfully to my unnumbered despatch of April 21, 1900, upon the subject of American dental degrees in Germany, to which I was honored with a reply by your department under date of July 17, 1900, No. 36, I have the honor most respectfully to report at this time:

1. That I have since placed myself in relation with the organized associations of American dental graduates in Southern Germany, and, in connection with the learned counsel of this Consulate, have advised them how to conduct themselves in their relations with the government and press, and in the defence of those of their members who have been or are being prosecuted for what is termed here an "unlawful" use of their honestly acquired titles of D.D.S.

2. That at the same time, in all cases, whether of gentlemen holding legitimate diplomas or of persons holding illegal issues, I have been in constant communication with the Bavarian Department of Justice and the Foreign Office to protect the rights of all legitimate holders of such American degrees, correctly issued, to use and advertise their degrees, and to secure the prosecution and conviction of those illegally holding American certificates or honors.

My task has been a peculiarly difficult and delicate one, as there is, in the first place, even among educated and intelligent Germans, a misconception of the character of American universities, and especially the schools of dentistry, on account of many of them being, so far as their original organization is concerned, in form at least, private concerns; and among the less informed a strong prejudice against American degrees on this account. It has, therefore, been a matter of propaganda to bring the authorities to un-

derstand that under the republican forms of government existing in the several States, where so much is necessarily left to private initiative, these institutions, although in form private enterprises, by virtue of their charters and the right of visitation and control by the State authorities, are in fact public institutions.

Another difficulty lies in the fact that the German universities, stimulated by the reputation and success of American dental colleges, have added dental departments to their curricula, which, in theory at least, are not inferior to the average American institutions; and among others the University of Munich has recently established such a department, which in equipment and the character of its instruction will prove inferior to no other.

The purpose of this instruction in dentistry at the German universities is to offer to Germans the opportunity of educating themselves thoroughly in that art and to raise the estimation of German dental degrees to the American standard, so as to induce students to remain at home.

It is easy to comprehend how this jealousy of American degrees finds its expression not only among prejudiced people, but also among holders of German dental degrees in denunciation of American degrees and dental institutions, and also in efforts to bring about a prohibition of their use in Germany.

I have good reason to believe that I have met these difficulties successfully and have been able to convince the authorities here of the value of legitimate American university honors and the titles of technical schools, and of the expediency of not prohibiting them; also of the sincere desire of the United States government to do everything possible to prevent the issue of worthless diplomas, and to effect the closing of institutions issuing them.

My main endeavor has been to secure such evidence as might be of service in proceedings against the institutions issuing illegitimate diplomas, and I have already obtained possession of original diplomas and certificates in two instances where they were purchased in America by Germans, against whom proceedings are now pending.

In one of these cases I have had the diplomas copied by photography and type-written copies of the certificates made, specimens of which are hereto annexed marked Exhibits A, B, C, D, E, F. I have applied to the legal authorities to have the original diplomas and certificates in these cases delivered to me for trans-

mission to the State Department, for use as evidence in any proceedings it may be deemed expedient to institute, and though such a course is difficult to effect, I hope for a favorable answer.

Owing to the urgency of the case, I have also transmitted copies of these diplomas and certificates to his Excellency the Governor of Illinois and a copy of my letter to him is hereto annexed, marked Exhibit G.

On December 10, 1900, a very interesting case was settled in the courts of Munich against one Samuel Gumpoldt, once a "Zahn-techniker," now a full-fledged "American Dentist," claiming also to be the holder of the American degree of Doctor of Dental Surgery. He obtained the "Doctorate" at one of those non-reputable dental schools, of which two remain to be suppressed in Chicago. "Dr." Gumpoldt went to America some time last spring, remaining a few weeks in Chicago, and came back with a certificate from the "State Board of Dental Examiners," permitting him to practise dentistry in Illinois. The States Attorney here made the polite request that I should testify as an expert in the case in order to establish the illegality of the defendant's claim, and as a result the "Dr." was condemned for terming himself "Amerikanischer Zahnarzt" and heavily fined. The case, of course, will be appealed, but it is to be hoped that the governor of Illinois will cause an inquiry into the illegal practice prevailing in that State by issuing such certificates as in this instance, as the State Board is only expected to admit to examination a candidate who has spent at least six months in a regular dental school. In this instance the "Dr." made certain claims as to studies in Roumania, but I fear the State Board of Illinois has no "evidence" to substantiate these claims.

Another case now in the courts is affording me the opportunity to secure by the aid of photography the needful evidence to convict of such illegal practice the other now remaining non-reputable institution in Illinois making a business of the sale of diplomas, and I shall have the honor to submit this report by an early post.

The rapidly growing tendency among the peoples of the German Empire to bar out as far as possible all foreign competition may, as I have already suggested, force the governments of the various States to a more determined warfare in behalf of the dentists educated in the schools of Germany only, against those bearing the distinctive honors of the American dental schools, thus

ultimately affecting not only the good standing of American dentists abroad, but also destroying their usefulness, if not barring them out altogether. It is to be hoped, therefore, that the course taken by this Consulate, however great the sacrifice in labor and time, may prove both timely and judicious, maintain the integrity of our worthy schools of dentistry, and preserve them in honor abroad as well as at home.

To this end I would most respectfully ask you whether you do not deem it expedient that publicity be given through the press in America to such institutions and in Germany to punish persons holding and advertising their diplomas, in order to deter foreigners from purchasing such titles and thereby to destroy the market for them. I have abstained entirely from any communications whatever to the press, but believe that the widest publicity should be given the whole subject.

I have the honor, etc.,

(Signed)

JAMES H. WORMAN,

United States Consul.

(Enclosures.)

Photograph of diploma granted "Johannes Fuchs," conferring the degree of Doctor of Dental Surgery, granted by the "Cosmopolitan Post-Graduate College" of Chicago. Dated October 25, 1899. Signed, C. A. Weil, Dr. Med., Chancellor; Emanuel Kargan, D.D.S., Dean; C. A. Williams, Rector.

Photograph of diploma granted Dr. Johannes Fuchs by the Haskell Post-Graduate School of Prosthetic Dentistry. Dated October 16, 1899. Signed, L. P. Haskell, Pres.; G. A. Grant, Secretary.

(Copy.)

BUFFALO, N. Y., February 9, 1901.

DEPARTMENT OF STATE.

THOS. W. CRILLER, *Assistant Secretary*:

SIR,—I am in receipt of a communication from you enclosing one from the United States Consul at Munich, concerning the American dental diploma and other matters. I can assure you, sir, that I deem it of the very highest importance to the dental profession of America, and I believe that the Consul is doing a work that will advance the interests of many American citizens. Unless I am advised that the communications are in any way con-

fidential, I shall forward them for publication in some of our most important professional journals. I beg that any future advices that the State Department may receive of the same nature may be forwarded to me for communication to the dental profession of America.

I am very truly yours,

(Signed)

W. C. BARRETT,

Chairman Foreign Relations Committee, National Association American Dental Colleges.

DEPARTMENT OF STATE,

WASHINGTON, February 13, 1901.

W. C. BARRETT,

Chairman Foreign Relations Committee, National Association Dental Faculties, Buffalo, N. Y.:

SIR,—I have to acknowledge the receipt of your letter of the 9th inst., suggesting that the despatch from the Consul at Munich in regard to bogus dental institutions be published. In reply I have to say that the Department sees no objection to your publishing it.

I am, sir, your obedient servant,

DAVID J. HILL,

Acting Secretary.

(Copy.)

BUFFALO, N. Y., February 9, 1901.

HON. JAMES H. WORMAN,

United States Consul at Munich:

SIR,—I am in receipt of a communication from the Department of State of the United States government enclosing a report, or copy of a despatch, concerning American dental degrees in Germany. I enclose copy of my answer to the Third Assistant Secretary in reference thereto. I beg personally to assure you that the great number of dentists in the United States and the graduates of American colleges abroad will fully appreciate the importance of the work you have undertaken, and will extend to you their enthusiastic support.

By this mail I will forward to you copies of the reports of this committee, which will give you some idea of what we are attempting to do. Let me say that we now have in prison a number of those who have been engaged in issuing fraudulent diplomas, and

hope the traffic is now upon the point of being broken up in America.

I beg, on the part of my colleagues, to tender any service on our part in your good work, and I request that I may be favored with any reports or other documents which may assist in the work in which we are engaged.

Very truly yours,

(Signed)

W. C. BARRETT,

*Chairman Foreign Relations Committee, National Association
American Dental Colleges.*

THE FIFTH DISTRICT DENTAL SOCIETY.

THE Fifth District Dental Society of the State of New York is to tender a complimentary dinner to Dr. S. B. Palmer, of Syracuse, N. Y., in honor of his long years of faithful service, both in his office and in behalf of the profession at large.

Representative members of the dental fraternity will be present, and the affair promises to be most enjoyable.

The dinner is to be given at Syracuse, on the evening of April 13, 1901, and an invitation is extended to the profession to be present. Dinner-tickets will be issued before April 1, on receipt of \$5.00. Address the chairman of the committee in charge, Dr. G. B. Beach, 518 S. A. & K. Building, Syracuse, N. Y.

G. B. BEACH,

A. RETTER,

SHERIDAN SLOCUM,

G. H. BUTLER,

J. C. CURTIS,

Committee.

TRI-STATE DENTAL ASSOCIATION.

THE Tri-State Dental Association (Indiana, Kentucky, and Illinois) meets in Paducah, Ky., May 28, 29, and 30, 1901. W. H. Brosman, Secretary, Albion, Ill.; W. H. Pitcher, President, Paducah, Ky.

W. H. BROSMAN,

Secretary.

THE

International Dental Journal.

VOL. XXII.

MAY, 1901.

No. 5.

Original Communications.¹

RELATIVE EFFECT OF A COMMON ENVIRONMENT UPON ENAMEL.²

BY FREDERICK L. BOGUE, M.D., D.D.S., NEW YORK.

MR. PRESIDENT AND GENTLEMEN,—The subject of the short paper which I have the honor of presenting to you this evening is "Relative Effect of a Common Environment upon Enamel."

Dr. Black, in his paper upon "The Physical Characters of the Human Teeth," confined his experiments and derived his conclusions from a study of the dentine. As teeth are more or less perfectly covered with enamel, and until this is penetrated the dentine is not attacked, it seemed fitting that some experiments should be made upon this important structure to ascertain if it was responsible for the apparent differences between Dr. Black's conclusions and those held by the profession up to that time, which were based principally upon more or less careful clinical observation.

That environment has a greater bearing on the liability to decay, and that the physical and chemical properties of the teeth of dif-

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology, February 5, 1901.

ferent individuals are more nearly alike than had ever been appreciated before, I think is perfectly true, but that the rapidity of decay is entirely dependent upon the environment, and that the physical and chemical structure of the teeth has no bearing, I think has not been adequately proved.

Clinically we sometimes discover a well-defined cavity in the approximal surface of a tooth, while the adjoining tooth is in perfect condition. These teeth have been exposed to the same environment; how do we account for the greater resistance shown by one of the teeth? If teeth in the same mouth show differences in the amount of resistance, is it not natural to suppose that there may be even greater differences in teeth taken from various individuals?

There are also deviations from the normal forms of teeth, due to interrupted development, sequelæ of some special disease, such as measles or syphilis. Are teeth of that character, aside from their defective mechanical structure, no more prone to decalcification than perfectly normal teeth?

According to Mr. Tomes, the microscope shows that "the tissues are not only deficient in quantity, but they are defective also in quality. The elements of the enamel are imperfectly combined, hence the tissue is porous, yellow, opaque, and very fragile." If it were possible to have a common environment and teeth of exactly the same chemical composition, there would still be differences in the degree of disintegration depending upon what we term predisposing causes,—*i.e.*, 1, regularity or irregularity of the teeth; 2, differences in individual shape of the teeth and their location as regards the salivary ducts; 3, variations in the thickness of the enamel-cap, and differences in its mechanical structure, whether without blemish and fused at the bottom of the sulci or, on the other hand, having pits and grooves in the surface and defective sulci extending entirely through the enamel into the dentine.

These predisposing causes naturally should be eliminated so far as possible in experiments which are intended to show the comparative resistance of different specimens of enamel in the presence of a common decalcifying agent. To accomplish this the teeth were covered with wax except for that portion of the surface which was to be exposed to the action of the solution.

The experiment tried was the production of artificial decay on a number of teeth so prepared, in a mixture of bread and saliva, to ascertain if the rate of decalcification was uniform in the different

specimens. The mixture of bread and saliva was the only medium used in the experiments reported this evening, and was chosen first as being the least unpleasant. During the process the teeth were kept at the temperature of the body in a small water oven, the gas flame warming it being controlled by a thermostat.

The first time, seven bottles of the solution, each containing ten teeth, were kept in the oven for two months. As often as was necessary to keep them well covered more of the solution was added. At the end of this time the teeth were removed and carefully examined, and it was found that there were differences in the amount of decalcification. After finding these variations it was thought possible that the environment might have been different in the several bottles, so it was decided to repeat the experiment, placing the teeth in a single vessel. Also, as further investigations were to be made, it was necessary to examine them to determine their condition,—whether the pulp was alive or dead, whether they were decayed or sound, etc.,—and to number them so that they might be kept track of during the work.

The second time one hundred teeth were used and treated in the same way as the first, except that they were all placed in one vessel. At the end of two months these were removed and examined, and again differences were found in the amount of decalcification.

I will pass around a few specimens of the teeth so treated, that the gentlemen may see the difference in the amount of decalcification. These are the extremes, and for this reason are in a measure misleading, inasmuch as the majority of the teeth range between these points, and the degree of difference in them when taken as a whole is much less marked than this.

To determine more accurately the relative degree of decalcification in the different specimens, fifty blocks of enamel were cut from them and the edges filed down until they were all of equal weight (twenty milligrammes). These were exposed to the action of the solution for six weeks. They were then removed and reweighed with the following results: nine weighed eight to eight and one-half milligrammes each; eight, eight and one-half to nine and one-half; sixteen, nine and one-half to ten and one-half; nine, ten and one-half to eleven and one-half; six, eleven and one-half to twelve and one-half. In other words, nine specimens lost between eleven and one-half and twelve milligrammes in weight; eight lost between eleven and one-half and ten and one-half; sixteen lost

between ten and one-half and nine and one-half; nine lost between nine and one-half and eight and one-half; and six lost between eight and one-half and seven and one-half milligrammes.

Twenty-five more specimens were cut, each weighing fourteen milligrammes, and were exposed to the solution for two weeks, with the following results: two weighed 13.9 milligrammes each; five weighed thirteen milligrammes each; three weighed 12.9 milligrammes each; three weighed 12.1 milligrammes each; six weighed twelve milligrammes each; three weighed 11.6 milligrammes each; three weighed 11.2 milligrammes each.

The relative specific gravity of the enamel of these teeth was determined to see if there was any relation between the density of the enamel and its liability to decalcification. While the differences in the relative density were rather greater than those found by Dr. Black in his investigations on the dentine, the variations found do not seem to have any fixed relation to the amount of decalcification so far as I can see at present.

Of course, these results are by no means conclusive, as but a single environment was used throughout, and until sound portions of these teeth have been exposed to other environment and differences shown in every instance, it cannot be stated positively that factors other than environment have a bearing on the rapidity of decalcification, but I think it may reasonably be said that the question is an open one.

SOCIAL CONSANGUINITY, NEAR KIN, EARLY AND LATE MARRIAGE.¹

BY EUGENE S. TALBOT, M.D., D.D.S.²

FROM the general principles of heredity elsewhere laid down,³ it must be obvious that the influence of intermarriage in families has been over-estimated as a factor *per se* in producing defect. The idea of the advantages of cross-breeding which seemingly appeared in the practice of exogamy (marriage outside the tribe, or more often outside those having the same totem or coat of arms) arose,

¹ Advance chapter from the fourth edition of "Irregularities of the Teeth."

² Fellow of the Chicago Academy of Medicine.

³ Chapter II. of the work.

as I have elsewhere shown, from observation of deformities ¹ following intermarriages contracted after the killing of girls for economic reasons has led to exogamy. The idea of incest ² was of religious origin rather than innate, since totemic relationship (which was chiefly prohibited) was far from being consanguineous. The totem was a mark indicating descent from a supposed animal ancestor endowed with occult powers. The children with the bear totem of one tribe could not marry those having the bear totem of any other tribe. From this practice sprang the medical, theologic, and legal notions anent the danger from marriages of consanguinity, which, as D. Hack Tuke ³ remarks, insisted upon from time to time by medical writers, has been recognized by ecclesiastic authority, civil law, and by popular feeling. By ecclesiastic and civil law, marriage of those very nearly related has been forbidden on other grounds than that of alleged danger to offspring. At the same time the justice of such laws receives support from medical observations, which tend to show that intermarriage may produce degeneracy, idiocy, and insanity. I have elsewhere analyzed this evidence,¹ and shown that for the facts there is more than one explanation. The explanation pointed out by Strahan ⁴ underlies the chief danger in intermarriages. With a perfectly healthy stock, as every breeder of animals knows, remarks Strahan, "in-and-in breeding" may be practised with impunity, but where the stock is tainted with disease or imperfection, safety is only to be found in "crossing."

The error of the old doctrine upon which was founded the prohibition of consanguineous unions lay, as Strahan remarks, not in asserting that disease and deformity were more met with in children of these than those of other unions, for such is the fact, but in attributing these unhappy results merely to parental blood kindred. Over and above the fact that these consanguineous marriages are almost certain to transmit, in an accentuated form, defect or tendency to disease already present in the family, there is no physiologic reason why such marriages should not take place. Breeders of prize stock frequently breed "in-and-in," not only with impunity, but with marked benefit. But this fact, while going

¹ Degeneracy.

² Durkheim *Année Sociologique*, 1898.

³ *Psychological Dictionary*.

⁴ *Marriage and Disease*.

to prove that it is not the mere blood relationship of the parents which induces the degeneration too often found in the children of consanguineous marriages, can but rarely be advanced as an argument in support of the marriage of blood relations. The stock-raiser only permits the more perfect members of his flock and herds to continue their kind. For this reason "in-and-in" breeding is innocuous, just as it would be in the human family under like conditions.

Recently acquired characters, whether physiologic or pathologic, are very liable to disappear when the individual bearing such characters intermarries with another not having the same character. The natural tendency in all such cases is to revert in the offspring to the normal or healthy type, so that, unless the new character be very deeply impressed upon the parental organism, it is almost certain it will not appear in the offspring if the other parent have nothing of the character. But when both parents are possessed of the character, whether it be physiologic or pathologic, this natural tendency to revert to the original is often overborne and the character is repeated in an accentuated form in the offspring.

Now, this accentuation of family characters is what must always happen in the case of consanguineous marriages. If there be taint in the family, each member will have inherited more or less of it from the common ancestor. Take the case of cousins the descendants of a common grandparent who was insane and of an insane stock. Here the cousins are certain to have inherited more or less of the insane diathesis. Even if the taint have been largely diluted in their case by the wise or more likely fortunate marriages of their blood-related parents, yet will they have inherited a certain tendency to nervous disease, and if they marry they must not be surprised if that taint appear in aggravated form in their children. Some children of such parents are idiotic, epileptic, dumb, or lymphatic, and the parents marvel whence came the imperfection. In some cases the parents, and possibly grandparents, of the unfortunate children have not displayed any obvious evidence of the tendency to disease which they have inherited and handed on to their descendants. Not looking farther back, the parents boldly assert that such a thing as insanity, epilepsy, scrofula, etc., is unknown to their family. They themselves have never been insane; why, then, should their children be? In like manner children may be epileptic, blind, deaf-mute, lymphatic,

cancerous, criminal, drunkards, or deformed from direct inheritance, and yet the family line be honestly declared to be healthy.¹

The truth of Sir William Aitken's maxim, that "a family history including less than three generations is useless and may even be misleading," is hence obvious. Similarity of temperament induced by a common environment, which Strahan calls "social consanguinity," is hence also a potent factor in the production of all hereditary degenerations. Living under similar customs, habits, and surroundings, laboring at the same occupation, indulging in the same dissipation, tend to engender like diseases and degenerations irrespective of any blood relationship. Hence it not seldom happens that persons not even distinctly related by blood are in reality much more nearly related in temperament than cousins or even nearer blood relations who have experienced widely different modes of life. This "social consanguinity" is the great curse which dogs every exclusive tribe and class and hurries them to extinction. It has largely aided real or family consanguinity in the production of the diseases and degenerations which have so heavily fallen upon the aristocracies and royal families of Europe. This "social consanguinity" appears likewise in the tendency of the neurotic to intermarry, popularly expressed in the proverb that "like clings to like." This likeness in mental characteristics has been shown to be present by Roler, de Monteyel, Kiernan, Bannister, and Manning, so far as Germany, France, the United States, and Australia are concerned. Bannister puts the statistic proof of this tendency thus forcibly: "There are in Illinois, according to the most recent estimates in round numbers, about six thousand insane, or one to a little over five hundred of the population. Even if we double, treble, or quadruple this frequency, to include all that have been or are to be insane, as well as those insane at the present time, it would not appear that there was much probability of two insane persons being married according to any ordinary law of chances.

¹ Heredity consists in the transmission of sufficient hereditary potency to pass the inherited quality through intra- and extrauterine periods of stress when certain functions and organs disappear to give way to others developing. At one of these periods the polyphyodont tendency gives way to the diphyodont. Through the influences of these periods of stress marked acquired defect becomes minor or *vice versa*. Through the period of stress the influence of benign or malign atavism is exerted. See Chapter II. of the fourth edition of Talbot's "Irregularities of the Teeth."

In fact, we find that in four out of the one hundred and four with insane heredity both father and mother had been insane. In one of these cases the insane heredity involved both parents and both grandparents on each side, though in the case of the latter the histories show it only as collateral. In the cases of the three patients with direct paternal and collateral maternal heredity, two had also direct maternal and collateral paternal heredity, and in one case there was collateral heredity of insanity on both sides. This makes altogether ten per cent. of those with insane heredity, with it on both sides, maternal and paternal, and thus favored with a double opportunity to inherit mental disease. If to this be added the instances where with insanity of one parent there is either epilepsy, hysteria, drunkenness, brain disease, nervousness, etc., of the other, the ratio of double inheritance rises to over twenty per cent."

Since jaws and face are transitory structures, but relatively little taint is needed in a family or community to cause suppressive or hypertrophic degeneration of the face and jaws and irregularities of the teeth. The influence of this factor of these neurotic and "social consanguinity" tendencies in the production of deformities of the face and jaws and irregularities of the teeth cannot well be over-estimated. A test of these deformities is alleged to exist in the Polynesian populations of the Pacific Islands, where race admixture can be excluded for a relatively long period. Concerning the ancient Hawaiians, J. M. Whitney¹ remarks: "Here is a people isolated from all others for at least fourteen hundred years, with no admixture of races, yet irregularity of the teeth of both maxillæ is almost as common as it is among the mixed races of to-day." In social consanguinity of the Polynesians must be peculiarly reckoned their excessive and systematized licentiousness, shown in societies for the practice of extreme sexual indulgence like the Areoi.² Such societies would undoubtedly create neurotic states and tendencies and produce more marked degeneracy of the face, jaws, and teeth than intermixture of race or consanguineous marriage. The factors of race admixture cannot, as Denniker³ has shown, be completely excluded from consideration among the ancient Hawaiians. Since leprosy, like syphilis, may

¹ The World's Columbian Dental Congress Transactions, page 109.

² Schultze: Fetichism.

³ Races of Men.

simply check development without causing infection *in utero*, this factor has likewise to be taken into consideration. Furthermore, as Alvarez,¹ of Wailu, Dahu has shown that mortality among Hawaiian babies is very large. Hygiene is practically unknown to the mothers. Kava-kava (the fermented juice of the awa) is the great medicinal agent of the Kahuma (sorcerer, medicine-man), who is the chief medical resource of the natives. Syphilis is very common, especially the non-venereal type. The habits of the natives aid the spread of the disease. Under such conditions irregularities must result.

Among the factors interfering with the proper development of the child is the condition of the mother at the time of impregnation and during pregnancy. Age at pregnancy, exposure to improper diet, to narcotics, and to the toxic occupations, all play a part in checking foetal development. So, likewise, do frequently repeated pregnancies. The age of the mother at pregnancy is too much ignored in dealing with defects. J. Mathews Duncan² pointed out nearly two decades ago that the offspring of early and senile marriages were defective. Multiple and too nearly repeated pregnancies were of frequent occurrence. Conger³ (whose results were later corroborated by Joseph Workman⁴ and Kiernan⁴) points out that in all degenerative forms age of the parent must be taken into consideration, since it alone often determines degeneracy. Conger found that the age of the mothers of degenerates is below twenty-five years. Korosi,⁵ in an investigation of the influence of the age of parents on the vitality of children, found that the proportion of deaths among children from unhealthy constitutions or maladies traceable to the mother was twice as large among the children of mothers under twenty as among the children of mothers over thirty. The healthiest offspring were born of mothers between twenty and thirty united to husbands between thirty and forty. Where either husband or wife was under twenty, the offspring usually proved weakly. This is particularly the case even in Hungary, where the girls become women at thirteen. In that

¹ Pacific Medical Journal, 1893.

² Sterility, Fecundity, and Allied Topics.

³ Il Manicomo, May, 1886.

⁴ Alienist and Neurologist, 1887.

⁵ Orvosi Hetilap, 1894.

country in five per cent. of the number of marriages the brides are under twenty years of age.

Marro¹ finds that among all classes of criminals there is an excess of immature parents (under twenty-five) or senile parents (over forty-two). As I have elsewhere remarked, it is a well-known experience that the children of the aged readily show degenerate types.² Arthur Mitchell and Langdon Down have recognized the influence of premature and late marriages in the production of idiocy. Factors capable of producing idiocy may arrest foetal development at all stages. Kiernan³ has had under observation a Nova Scotian family of Scotch extraction, the mother of which continued to bear children until she was sixty-three years old. There had been no pregnancy between fifty and fifty-six. At fifty-six a son was born who had ear, jaw, and skull stigmata, and became a periodical lunatic at twenty-five. A son born a year after was a six-fingered idiot with retinitis pigmentosa. Three of the next children were paralytic idiots in infancy. One of the next children was a periodical sexual invert female. The last child was an epileptic. The children born before the age of fifty were normal, and averaged sixty years of age.

THE CONSTRUCTION OF ARTIFICIAL CROWNS.⁴

BY JAMES P. NICHOL, D.D.S., PHILADELPHIA.

MR. PRESIDENT AND GENTLEMEN,—It is not my intention to attack any established rules or theories this evening in regard to the methods you have already employed.

I have been asked to present a paper to you, taking for my subject "The Construction of Artificial Crowns," and calling attention to some practical points in their manufacture.

I esteem it an honor to come before this society, and being an active student in this line of work, I feel that in any discussion that

¹ La Puberta, 1892.

² Degeneracy, op. cit.

³ Detroit Lancet, 1882.

⁴ Read before the Academy of Stomatology, Philadelphia, February 26, 1901.

might follow we may be able to get some ideas that will be a benefit to all of us.

Let us take the Richmond crown, for instance. You are all familiar with the construction of this style of crown. Allow me to ask, Why should such heavy backings be used? We all know there is absolutely no union between platinum, or other metal used for backing, and the porcelain facings.

Now, if soft platinum about 1/1000 gauge (same as is used in inlay work) is used and burnished nicely around all the edges after soldering and finishing the piece, we get splendid margins, and the danger of checking facings, so far as tight backings are concerned, is almost eliminated.

The method I have been using in backing a Richmond incisor is as follows: cut the backing a trifle larger than the facing all around; on the approximal surfaces let it overlap about a line, on the cutting edge leave it, say, about one-sixteenth to one-eighth of an inch long; by snipping it along this edge at intervals the wrinkling may be avoided, as it conforms to the curves of the facing.

It is well to punch the pin-holes in the backing as near the exact size of the pins in the facing as possible; if they are enlarged, as they usually are, the flux or borax will be drawn through between the backing and facing and will cause checking of the facing. After the backing is burnished nicely the piece is placed on the model and waxed up; this being done, brace the piece with the fingers on the labial or buccal surface, and by pressing on the wax you can crowd the soft thin backing to the facing; thus getting an excellent adjustment. In investing the piece let the material cover the overlapping edges so that when the wax is removed the backing will be held in position by the investing material until the piece is soldered.

In the construction of the Richmond bicuspid crown there is another point to which I would call attention, that is the joint between the cusp and the facing.

To make an artistic piece of work and show the least possible amount of gold, a mitred joint should be used so that the cuspal end of the porcelain is ground at an angle of about forty-five degrees with the back of the facing.

We must not overlook the contraction that takes place, more or less, after soldering a crown of this type, and with this in view we should fit the joint between the cusp and facing accordingly.

After the facing has been bevelled and waxed in position, the cusp is then filed to the opposite bevel of porcelain. In placing it in position it should fit the facing closely at the buccal aspect and stand out slightly at the flat surface, or, in other words, at the backing; in cooling after soldering the contraction would take place almost on a line with the points designated, and the joint be closed.

Another question has been asked many times, "How do we account for the checking of facing?" Let us look over the work in a few stages of its construction and see if we can locate the cause.

It is my opinion that the dentist is at fault in nine cases out of ten. I have tried a simple experiment by taking a facing made by each of the largest tooth manufacturers and placing them in a furnace together with some solder; after heating the furnace to the fusing point of the solder, I shut off the current, removed the facings, and failed to find any checking. I therefore conclude that the checking is not due to the inability of the facing to withstand the high temperature requisite for soldering.

In the first place, the porcelain should not be heated up too much by grinding, as the uneven heating by friction will weaken it. Secondly, the wax should all be removed before the backings are fitted (wash with chloroform). Thirdly, the backings I have already mentioned in detail. Fourthly, the heating up and soldering, and here to my mind is the stage where the greatest amount of checking is done.

We are, of course, well aware that platinum and vitreous materials, like glass and porcelain, have approximately the same coefficient of expansion when subjected to uniform changes of temperature. Practical recognition of this similarity of expansion and contraction is shown in the use of platinum wires as electrical conductors when fused into the bulbs of incandescent electric lamps, as well as its various other forms of vacuum electrical appliances or apparatus; for example, Geissler and Crookes tubes.

It is not the high fusing-point nor the unalterability of platinum which renders it especially useful for this purpose, but the much more important property of its coefficient expansion with that of glass.

It is this property also which, quite apart from its high fusing-point, makes it the most suitable metal to construct pins for porce-

lain artificial teeth, around which the porcelain body must be fused in order to retain the pins in place.

But while the coefficient of expansion of the platinum and porcelain respectively is practically the same, it must not be forgotten that the relative rates of expansion of these two bodies is directly proportional to their rates of thermal conductivity.

Hence, as the rate of thermal conductivity of platinum is much higher than that of porcelain, it becomes necessary, in order to avoid checking of a porcelain facing, not to heat the facing suddenly, whereby the limit of expansion of the metallic pins is reached before the increase in temperature of the surrounding porcelain material has developed a compensating expansion to offset the strain which would otherwise be produced by the premature expansion of the metallic pins.

It is the too sudden application of heat which, in my judgment, is the most fruitful source of fractured facings in the soldering operation.

After a piece is invested it is not essential to have the case thoroughly dried before heating up; it may be placed on the furnace and warmed up slowly, removing the wax in due time. After the investment turns brown (showing the wax to be burned out), the flame of the blow-pipe is then applied around the outer surface of the investment, but never to the metallic structure,—namely, the pins and backing.

Now, the parts being heated to a point where the solder will flow, if the flux be used judiciously the percentage of checked facings will be reduced to a minimum.

The full gold crown is causing considerable comment at the present time, and several “swaging appliances for seamless crowns” have been placed on the market recently. I will state that this type of crown may be produced absolutely seamless in about half the time it takes to go through the swaging method; there is no danger of splitting the metal in stretching, and a perfect occlusion may also be obtained.

The method, in short, is as follows: Measure the tooth, cut and sweat a band (by sweating I mean the union of the cut ends by the autogenous method of direct fusion). The contouring may be nicely done with heavy short-beaked pliers, stretching or bulging the band out to within one-sixteenth of an inch of the cervix, at which point it passes beneath the free margin of the gum.

After shaping the occlusal margin of the band and making proper indentations for the fissures, a cusp is selected or an impression of the occluding tooth used, and by means of a special stamping device a matrix of pure gold about 2/1000-inch gauge is struck up, and filled with the same karat gold that the band is made from; the cusp is filled true, making contact with the band at every point, and held in position with binding wire; the joint is fluxed, and with the piece lying on charcoal the band and cusp are united without solder by means of the blow-pipe. The result is a seamless crown in which all danger of discoloration is avoided by the absence of the solder; on the other hand, the sweat-joint in the band is more pliable and is equally as strong as any part of the band.

Even though we grant that the result may be practically the same with either method, the swaging process is defective inasmuch as it fails to develop and maintain that high degree of manipulative skill which it should be the ambition of every operator to attain and conserve; it is the difference between the product of the skilled and artistic workman and the automatic machine.

The porcelain art in dentistry, or the method of baking artificial crowns, etc., is one that is also exciting a great deal of interest among our profession. For single crowns on the ten anterior teeth it would seem that here would be its widest range of usefulness, as it is a question whether it will ever replace the all-gold crown or modifications of the same for strength and durability on the molar teeth, certainly not in the very short bite cases, as it is in proportion to the amount of porcelain used in this work that we get the best results in resisting the force of mastication.

I do not mean by this that the metal construction work is to be overlooked in any way, but, porcelain being a fragile substance at best, it depends almost entirely upon the bulk of porcelain body for strength.

I believe that a well-constructed porcelain incisor crown is as strong, and will last as long, as a Richmond crown, in which we are dependent entirely on the pins for strength to hold the facing, but in the baked porcelain crown the body is fused to the surface of the facing and will not break away.

The shade is more easily retained, and this is very often changed considerably by the backing; the facing seldom or never loses any of its translucency, which it does to a certain extent after a backing has been used.

SOME CONSIDERATIONS OF THE DENTAL OUTLOOK IN CUBA.¹

BY ERASTUS WILSON, M.D.²

It is hoped and expected that the Aurora of the twentieth century will awaken many innovations in the island of Cuba. Among others, we, for the first time, are making efforts towards organizing the profession of dentistry upon a scientific basis.

Hitherto, although a limited number of dentists who have had the advantage of a scientific training in the United States (mostly Cubans) have been practising here, the vast majority have been working at it as a handicraft or trade, which, from their point of view, requires little time for preparation in order to acquire the slight knowledge and skill of their teachers who had obtained their own preparation in the same way.

Indeed, several of these teachers had no, or very few, dental patients, but gained their livelihood by the fees paid them by their pupils, and by the transient public attracted to them by their skill in advertising and in obtaining authority from former venal governments to dispense diplomas as part of their business. The island is now pretty well stocked with diplomas of their origin, whose possessors offer the public cheap prices in correspondence with the quality of their services.

These chaotic conditions are to be principally charged to account of the deranged and disorganized state of our society, due to two destructive wars and the complete breaking up of our former social system, the final destruction of the antique moulds in which society was cast, and the sudden annihilation of our former wealth, which had been developed by forced labor of human chattels.

These disastrous cataclysms disjointed everything here, and in the resulting chaos many of the unemployed caught at every floating straw that seemed to offer them a means of living, and many, no doubt, believed that by a short tuition in the aforesaid extemporized schools of dentistry they could acquire a profession that would bring them wealth, while in order to learn any other

¹ Read before the Third Pan-American Medical Congress, held in Havana, February 4, 5, 6, and 7, 1901.

² President of Section of Oral and Buccal Surgery, P.-A.D.C.

trade, several years would be necessary to attain to the acquired skill. Thus from all this class of recruits to our ranks, our calling takes a lower grade than any other handicraft or trade.

Under these circumstances it need not surprise any one if many of these recruits are illiterates of low class, or that the majority of those of our calling in this island are not capable of exemplifying the best service our modern profession is able to give to the public.

As it is always the majority of any profession or art that determines its social category, it must be the persistent effort of the better class of our members to multiply their proportional numbers by a higher class of recruits, which fortunately our new scheme of public instruction somewhat favors.

In it dentistry finds a place in the official curriculum of the University of Habana, although it is there represented by only two professorships, and the selection of these two professors has been considerably controlled by antique habits of thought formed under the old influences and by an insane Chauvinism or race jealousy here still extant.

Although there are here several Cuban dentists well qualified for professorships, with diplomas from some of the leading American dental colleges, who were available and desirous of occupying them, none of these were given the most important of the two professorships.

We may, however, consider it one step in the right direction to obtain a place for our art in the university classes. It is now presumable that it will guard the door to our profession, which has until now been wide open to all comers, however illiterate, who could produce a few five dollar pieces of money, as key to the situation. Some literary qualifications will henceforth be required, and a less number of abuses will creep in; but the dental class as now organized in our University will not be able to graduate competent alumni; compelling them, as it does, to acquire in the regular medical classes the fundamental elements of medicine will not alone fit them as dentists. If it were so, then every regularly educated physician would be a dentist of competent skill. A few hours each day in the interval between the medical classes dedicated to the dental operating-room clinics and mechanical laboratory are not sufficient preparation for dental practice.

Our specialty is eminently a branch of preventive medicine

both in its operative and prosthetic aspects; but, although our students should be well grounded in the elements of general medicine and the special buccal pathology and therapeutics, far the major part of dental service to society is dedicated to the conservation of the natural organs and the construction of efficient and artificial substitutes for such of the dental organs as may have been lost by want of proper attention to their care. A proper education in these practical parts of our profession can only be acquired by several years of constant clinical exercises under skilful instructors.

Dental education has been organized in the Habana University by authorities not connected with our specialty, and so far as I know without consultation with any of its members; but I regard it as one step towards a proper organization of our profession here, and for which we ought to be duly grateful and are in duty bound to give it moral support, but with persistent recommendations for a better organization.

My own idea is that at least two years of previous technical training in the laboratory of some well-known dentist and a certificate of proficiency should be one of the requirements for admission to University classes.

Thus the twentieth century opens with encouraging prospects for our island in all its aspects, and imposes upon us serious obligations to the fundamental laws of human progress.

It is our solemn duty to organize associative scientific efforts to generalize in the public mind a knowledge and appreciation of higher standards of excellence in dental operations and honorable professional dealings in order that our art may attain the legitimate social position to which its merits entitle it.

We are now face to face with this prime necessity, and in our first steps in its direction we meet with a grave obstacle that must be contended with. It is that horde of intruders, with no sufficient instruction nor regular training, many of which are in possession of the certificates and diplomas above referred to, and to which I attribute scant scientific significance, but on the authority of which they claim to be members of our profession.

We have here a certain and increasing number of competent dentists who fear to organize themselves together as such, in contradistinction to those, lest they appeal to the excitable Chauvinism or patrioteria which is now rampant in our island.

In the social organization of our profession here must we accredit with the public these irregulars by recognizing them as fellows, while all their operations and their current public advertisements are discreditable to us as a profession? Would such a recognition advance our professional credit? or would it not rather be a public acceptance by us of the low standard of excellence propagated by these parties? Science knows no political limits; but here political and racial jealousy occupies a menacing attitude unless we assume a conciliatory tolerance of the vestiges of the ancient *régime*.

What appears to me a practicable solution of this difficulty is the following,—viz.:

All those at present among us who have had a scientific training in our profession have obtained it in American colleges, consequently must be well grounded in the English language, and although dentistry has now a place in our University, several years must pass before it can graduate its alumni,—this without consideration of its infantile and imperfect organization; therefore we may organize in two separate dental societies, one English speaking and the other Spanish speaking, so that one may in no way antagonize or interfere with the proceedings of the other. In this way would be two distinct categories which would operate as a continuous stimulant to those of one category to attain a competent degree of culture to enable it to secure recognition and entrance into the other, thus tending towards a continuous improvement in our merits and social standing in this community.

We have now a sufficient number of American graduates here to assure the rapid generalization of the greater proportion of the better class of dental work, which would soon raise the credit of our profession in the general estimation and will gradually force the cheap Johns into the background.

This Pan-American Congress will surely mark the inauguration of a new era here, social, professional, industrial, and agricultural.

Let us do our part of the social obligation to this new era, associating ourselves in organized form in order to facilitate and strengthen our efforts in fulfilment of this social duty. Then we may accredit ourselves with our inner consciousness and with outer society, and rise in the social scale while accrediting the better class of dental service at reasonable fees, which, however, must ever be more or less graduated to correspond with the finan-

cial ability of each patient, as this is both reasonable and honorable.

Raise the quality of dental work, and prices will raise themselves to the highest limits of appreciation and financial ability of each client.

FORCE REQUIRED IN MASTICATION.¹

BY FRANK M'S. THOMAS.

THERE seems to be some confusion in the use of terms in the discussion of the forces used in mastication. The words *force*, *power*, and *work* are frequently used synonymously, and in order to a more correct understanding it is well to remember that *force* is that which produces, or tends to produce, a change in the motion of a body or mass; *work* is done when a force produces a displacement of a mass; *power* is the rate of doing work.

Let the elementary mechanics of the operation be considered. It is known that a force which may be applied directly upon the object to be moved (without the intervention of a lever system) produces a stress equal to the force. It is also known that a force producing motion does work, and that work is represented by the product of force (*F*) and the distance through which it is exerted (*S*); or, $work = F \times S$.

In this country work is usually represented in foot-pounds, or the product of the force in pounds and the distance in feet through which the force is exerted. It is seen that work embodies only force and distance. Power must now be considered. This is the work done in a certain time, in a unit of time. The unit of power is the "horse-power," which is a certain amount of work performed in one minute: $P = \frac{F \times S}{T}$.

The horse-power is the power required to raise thirty-three thousand pounds one foot high in one minute. It will be observed that power embodies force, distance, and time. It is also known that work has an equivalent in heat. The unit of heat is the

¹ At the recent discussion upon the views of Dr. Black, at the Academy of Stomatology, Philadelphia, there was such a variety of opinion expressed that the matter was referred to an electrical engineer to give a technical explanation of the probable force used in mastication.—EDITOR.

amount of heat required to raise the temperature of one pound of water one degree Fahrenheit. This is the B.T.U., or British thermal unit.

Experimentally it has been shown that one B.T.U. is equivalent to seven hundred and seventy-eight foot-pounds of work.

It is seen that the heat unit embodies simply a change of temperature of a certain weight or mass of substance. Now, as the horse-power is thirty-three thousand foot-pounds per minute, and as one foot-pound = $\frac{1}{778}$ B.T.U., we have: H.P. = $\frac{33000}{778} = 42.4$ B.T.U.'s per minute.

Keeping these units in mind, the action of mastication may be applied. Neglecting the lever-like structure of the jaw and the point of insertion of the muscles, we may assume that the total pressure exerted is one hundred pounds, to be exerted at one point. We may suppose the force to be one hundred pounds. Now, assuming that the jaws considered at this point move one inch before the teeth occlude, and no work is performed upon the substance masticated until the occluding teeth are one-quarter of an inch apart, and that the one hundred pounds is exerted uniformly over this distance (one-quarter inch), we would have one hundred pounds acting through one-forty-eighth of a foot, or 2.08, a little over two foot-pounds of work done by each occlusion of the teeth. This is a small amount of work.

Now, assume that the teeth occlude one hundred and twenty times per minute; what power is expended? $\frac{2.08 \times 120}{33000} = .00758$ H.P., or less than one one-hundredth of a horse-power.

In remarks made in the discussion of Dr. Black's paper it was stated that a boy had cracked one hundred and fifty nuts in six minutes, requiring one hundred and fifty pounds to crush, and one hundred and fifty lemon-drops in six minutes, requiring sixty-five pounds to crush. It was pointed out that this aggregated many thousands of pounds, and this was regarded as a physiological impossibility. No mention was made of the distance through which these forces of one hundred and fifty and sixty-five pounds, respectively, were exerted. Thus the aggregate force in twelve minutes, without the distance being stated, is meaningless and misleading. Let this statement be taken and a value assumed for the unstated distance. Assuming, then, that when the nut or lemon-drop is distorted one-eighth of an inch it gives way and crushes or breaks. The teeth then only exert the maximum force through a distance of

one-eighth of an inch. So that the work on each nut is $150 \times \frac{1}{8} \times \frac{1}{12} = 1.5$ foot-pounds, approximated. Now, in six minutes one hundred and fifty nuts were cracked; therefore, foot-pounds per minute $= \frac{1}{6} \times 1.5 \times 150 = 37.5$.

Now for the lemon-drops. $65 \times \frac{1}{8} \times \frac{1}{12} = .67$ of one foot-pound. In six minutes one hundred and fifty drops were cracked: foot-pounds per minute $= 67 \times \frac{1}{6} \times 150 = 16.7$.

The horse-power required to crack the nuts in this case would be $H.P. = \frac{37.5}{33000} = .0011$, or a little over one one-thousandth of a horse-power.

For the lemon-drops, $\frac{16.7}{33000} = .0005$, or about one two-thousandth of a horse-power.

This is a very small power, because while the force is considerable, the distance is very small. Of course, power is required to raise the jaw to bring it in contact with the nut, but this is too small to be important.

As a comparative example, it may be assumed that a man weighing one hundred and fifty pounds ascends a flight of steps, or a ladder ten feet high, and does this in ten seconds. The work is fifteen hundred foot-pounds, or eight thousand foot-pounds per minute.

The power $\frac{15000 \times 6}{33000} = 27$, or a little more than one-fourth of a horse-power. This is two hundred times the power of the nut-cracking example.

Upon this showing that mastication is a comparatively small portion of the work accomplished by the body, the writer sees nothing improbable in the values given by Dr. Black as to the forces exerted by the muscles of the mouth.

A FEW CASES OF REPLANTATION.¹

BY DR. R. W. HUNTER, GREENFIELD, MASS.

BEFORE reading you the history of these few cases, I wish to state that I look on it as a last resort and allowable only as such. Nearly all of the cases in which I have resorted to replantation have been the result of alveolar abscess which I found incurable by other methods.

¹ Read before The New York Institute of Stomatology, February 5, 1901.

My first case of replantation was in June, 1895, a superior left bicuspid. The tooth had been under treatment for an abscess for many weeks, but a sharp curve at the end of the root baffled me, and I resorted to replantation. The tooth was extracted while the patient was under the influence of an anæsthetic. The curved portion of the root was cut away, the root and canals cleansed with listerine and warm water, the canals filled with gutta-percha, and the cavity in the tooth filled with amalgam. Then the socket was very carefully cleansed by syringing with listerine and warm water. The tooth was then replaced in the socket, which required some force. The tooth was quite sore for about ten days, after which the pain and swelling gradually disappeared.

In July, 1897, the same patient presented herself with the superior first bicuspid on the right side in much the same condition. This tooth had been previously treated and the canals filled. In my endeavor to remove the filling from the canals the root was perforated. The tooth was extracted and the same course pursued as with the other tooth, with equally good results.

Both of these teeth are at present firmly fixed in the alveolus and doing good service. The patient is a young lady of twenty-two or twenty-four years of age.

The next case came on July 22, 1897, the patient being a woman of about forty years of age. The tooth was a lower first bicuspid. Opening the canals, I discovered that they had been filled with cotton. Further investigation proved that the wall of the canal had been perforated. Not being satisfied with one perforation, I attempted to open into the canal beyond perforation, and succeeded in penetrating the wall myself. Replantation was resorted to, and within two weeks the tooth was comparatively firm. I had the pleasure of examining it last fall, and found it perfectly firm.

The next case is one which proved a failure. Happily, I can say the work was not mine, although the same result would probably have followed. The assistant in the office did it for one of his relatives. The operation appeared successful. Within two years the crown broke off and a Richmond crown was affixed. Within the next two years absorption set in, and the root was easily removed with an excavator.

The next case I shall tell you of is the most unfavorable of any I have ever attempted. The patient had lost the superior twelfth-

year molar early in life, and the third molar had moved forward to fill the space, tipping forward slightly. On opening into it to relieve an abscess, I found the canals filled with cement. Finding I could not get them clear without perforating the root, I removed the tooth and filled the tips of the roots and the cavity I had made, and replaced the tooth. Other cases had been easily retained by a combination of rubber dam and silk ligature; but for this I devised a cradle of annealed brass wire. This operation was performed October 27, 1899, and at present the tooth, although not perfectly firm, is better than before.

The last case I have to tell you of is more of a credit to Dame Nature than myself. On October 4, 1900, I replanted a superior right first molar. The next day the patient was taken with typhoid fever. When I heard of that I made up my mind that a failure would surely result. About a month ago the patient came in, and, to my surprise, the result is perfect.

UNILATERAL JUMPING THE BITE.

BY EUGENE S. TALBOT, M.D., D.D.S., CHICAGO.

A THIRTY-TWO-YEAR-OLD woman came to Chicago from a Western State to obtain relief from constant pain and fatigue. She is a degenerate. She has been married nine years and has one child. She has been losing flesh for a number of years, and has rheumatism in her limbs. There is constant pain in the occipital region and in the right glenoid fossa. The appetite is poor, assimilation defective, and she is badly nourished. She had considerable neuralgia. Her family physician and dentist being unable to relieve her, she was sent to a Chicago neurologist, who found the pain most intense on the right side of the face and neck. She was then referred to me.

The lower jaw is arrested. The lower incisors meet in a line drawn across the first bicuspids. The superior incisors and jaw extend half an inch beyond the inferior. When the mouth is closed the upper lip rests upon the superior alveolar process, while the lower curls underneath, continually exposing the superior incisors.

The face describes nearly a straight line from the neck to the tip of the nose. Ten years ago she had the lower right and left first molars, upper right cuspid, first and second bicuspid, and left first molar extracted. The result was that the teeth immediately changed positions. When I saw her the teeth had so moved about that the posterior edge of the left upper and lower second molar, the left lower cuspid, and the left upper first bicuspid just touched. Upon the right side the second lower bicuspid, upper first molar, and two second molars touch. The spaces between these teeth rendered mastication impossible. The lower jaw did not rest easily. The palatine cusp on the right superior second molar and the posterior lingual cusp in the inferior second molar were degenerate teeth and exceedingly prominent, so that when the jaw opened and closed the two cusps acted as an inclined plane, throwing the right condyle out of the socket one-fourth of an inch. This dislocation extended over a period of nine years. This was the cause of the pain, tired and exhausted feeling. Improper mastication of food caused the malassimilation. She could not masticate her meat, hence she did not eat it.

The effect of forward movement of the lower jaw, or "jumping the bite" (as Kingsley terms it), is to draw the condyle forward out of the socket. This places the capsular and stylo-maxillary ligaments on a continual stretch. The condyle rests upon an inclined plane, the eminentia articular and tubercle. An effort to hold the jaw in this position can be accomplished only when the person is conscious, since the movement is voluntary. During sleep, the jaws naturally return to a restful position. In the case of the patient under discussion, owing to loss of teeth, there was only one position in which the jaws could meet. The prominent cusps of the superior and inferior molars passed each other, throwing the condyle out of its socket and firmly locking the jaws. The continual stretching of the ligament caused not only pain, but weariness and exhaustion. The cusps were ground away, the four anterior teeth removed. A gold crown was placed upon the lower molar to fill the space and bring the teeth on a line. A plate was fitted to the upper jaw, and proper articulation was secured throughout the entire dental arch. The condyle remained in its proper position. She could chew beefsteak with a relish before she left Chicago. She experienced an uncomfortable feeling at the joint owing to the abnormal condition of the ligaments. The pain,

however, ceased. Her face (which had a careworn look) brightened. She continued to improve markedly in health after her return home.

Reviews of Dental Literature.

THE NON-SPECIFICITY OF MICRO-ORGANISMS IN DENTAL DECAY.—J. Choquet sent a paper to the meeting of the Odontological Society of Great Britain on January 28, 1901, on the above subject, which was read in his absence. This very important matter he, however, failed to make clear, but regards this paper as prefatory to others of more decided character.

He says, "It is our opinion that one of the most interesting points is to prove that, in contradiction to the opinion of a few authors, there is no specific micro-organism of dental decay. That is the point which I will try to study in this paper. The work I have the honor to present to the Odontological Society of Great Britain is the prelude of others in which I will show good proof that the greatest number of micro-organisms found in saliva or elsewhere can produce the histo-pathological disorders which we are accustomed to see. I hope this first paper will shake the theory of specificity. I have obtained very good results proving the truth of my theory, but these results I will give in a few months."

His conclusions are—

"1. There is no specific microbe of dental decay.

"2. Dental decay is produced by microbic associations. The microbic elements may be pathogenic or not.

"3. The starting-point of dental decay is the saliva and its contents."

The discussion which followed the reading of M. Choquet's paper is not only interesting but it assumes a degree of authority, coming, as the remarks did, from men of world-wide reputation in this particular line of scientific investigation.

DISCUSSION.

Mr. J. H. Mummery.—I do not think that either Dr. Williams or I suggested that *leptothrix racemosa*, as such, penetrated the tubes of the dentine, or was concerned in caries of the teeth, what-

ever part its supposed derivatives may take in caries. We stated that an organism such as the higher phase of *leptothrix racemosa* existing in immense quantities in the mouth must have some important significance. With regard to leptothrix in the tubes, I certainly have seen many specimens of carious dentine showing coiled thread-forms in the tubules, but of course it is open to question if such thread-forms should be classed as leptothrix, leptothrix being a term which has been much misused and applied to many different forms. I think it has been claimed by most bacteriologists who have given their attention to the subject that there are many acid-forming organisms in the mouth, and that several or all of these may cause dental caries. M. Choquet speaks of further papers on the subject, and we shall look forward with interest to further evidence in proof of his views, his present paper hardly carrying us very far in the direction of evidence. We much regret M. Choquet's unavoidable absence this evening, as in the discussion he would no doubt have enlarged on several of his points.

Mr. Kenneth Goadby agreed with what Mr. Mummery had said, and was extremely sorry M. Choquet was not present to give the proofs of his theories. He gave no proofs, but simply a mass of conjectures, which were more or less common to all workers on dental caries. He was somewhat surprised at the suggestion that Dr. Choquet's conception was an original one, because in the first place Miller pointed out that the first stage of caries was an acid production by the organisms on the surface of the teeth, and that probably the resulting process was one due to putrefaction. Then in a paper read before the Society in 1898 he (Mr. Goadby) went at some length into the question, and stated definitely that the organisms in caries might be classed under three heads. The third heading was perhaps more or less a provisional one, but the other classes to which he suggested the organisms of caries should be referred were those of acid-producing organisms and those of liquefying organisms. He went at some little detail also into the liquefaction of dentine by organisms which were capable of liquefying blood-serum. Of course, he did not mean that because an organism liquefied blood-serum therefore it would liquefy dentine, but it was a somewhat curious fact that those organisms which liquefied blood-serum liquefied also decalcified dentine.

Dr. Choquet suggested that the decalcification of dentine and the liquefaction of it were two processes to be considered from different physiological points of view of the organism, and that in one case it was a direct process, and in the other, the digestive, an indirect process. He did not quite know why Dr. Choquet divided those two processes. Both of them were nothing more nor less than the result of the activity of special organisms. It was the common property of dental bacteriologists and bacteriologists generally that any destruction of tooth-substance could not be anything but one related to the process of putrefaction, that was, a non-specific process. Dr. Leon Williams had stated that certain organisms he had observed produced acid. He (Mr. Goadby) criticised him at the time because Dr. Williams said he had a complete demonstration, when only a few organisms were described. Since that time he had had much pleasure in confirming much of Dr. Williams's work, and had obtained many of the organisms from the surface of the teeth which were capable of producing acids under given conditions, not always from the same carbohydrate, not always under the same conditions, and not alone, but in conjunction with other species. Some would produce acid from lactose when grown in the presence of a second one, but would not produce acid in the lactose solution by itself. He had always considered that the putrefaction to which caries was clearly allied a symbiotic process producing as final products carbon dioxide and hydrogen, so that he thought the specificity of organisms in dental caries was a question scarcely necessary of discussion. The most happy remark of Dr. Choquet was his allusion to the fact that the organisms described by observers differed in all cases. If Dr. Choquet referred to one of his (Mr. Goadby's) papers, he would find that he had followed Dr. Miller's work as far as possible. He had been able to confirm in one or two cases the organisms Miller described, and his own description appended had been of a sufficiently precise nature for a bacteriologist, in the modern acceptance of the term, to recognize the organism. But the difficulty was that the majority of the processes that had been used in the description of bacteria were processes that were at present considered inadequate. He cited as a parallel case Lister's early work. Lister discovered an organism which he named *B. lactis*, and described the method of obtaining it in pure culture; the organism in question was thought to cause many

of the conditions to which wounds were then liable. Later observers however, among them Hueppe, found that Lister's *B. lactis* was not a single species, but a mixture of about five distinct organisms, which were eventually isolated in pure cultivation. The principal part of dental bacteriology coincided with the period at which the work was done under the conditions he had just mentioned, and it had been extremely difficult to follow up from the writings of other observers the reactions they had given. He thought the question of observers not entirely confirming one another was due to their non-adoption of standard methods. He hoped to be able to recognize Dr. Choquet's organisms, although the descriptions given were insufficient.

Dr. Leon Williams said that Mr. Goadby had pretty well covered the ground, and left him very little to say. Four years ago, or even no longer than two years ago, there would, perhaps, have been more excuse for the subject-matter of the paper, because at that time belief in the specificity of the micro-organism of decay was pretty general. It led him a little less than two years ago, while he occupied the editorial chair of the *Dentist*, to point out clearly that there was no specific organism of decay, and that the relation of micro-organisms to dental decay was totally different from that in the case of specific diseases produced by micro-organisms. It was possible that in the circle in which Dr. Choquet moved the old belief still was held to a considerable extent, and that might be his justification for the position he had taken up in the present paper. The whole question of the specificity of micro-organisms was one which, at least, was open to discussion. The specificity was not so circumscribed as had been thought, but it was hardly necessary to go into that that evening. It all circled round one statement, that no fact could stand alone. The question of the specificity of micro-organisms was a question which involved the whole history of bacteriology. He should like to confirm what Mr. Mummery had said with reference to the relation between *leptothrix racemosa* and decay. He knew nothing which would support any statement that it was directly concerned in decay. It was always a great misfortune when the writer of a paper was not able to read it, as one felt a hesitancy in saying critical things when an author was absent.

Dr. Eyre agreed with the members who thought there was no necessity for Dr. Choquet's paper, and that it did not fill a

very obvious want. It seemed to him it was an opportune moment to urge on workers in the field of the bacteriology of dental caries the necessity of using standard media and of working out organisms according to some preconceived plan, and so adopting measures which would enable workers all over the world to identify the organisms and to realize whether those same organisms had been described before, and the names applied to them. In that way the list of organisms which were supposed to be concerned in the production of caries might be reduced very considerably, and those organisms might then be worked out more thoroughly. He was anxious to ask Dr. Choquet for some information about the various media with which he worked. In a paper in the *Dental Cosmos* a little while back, Dr. Choquet gave a list of twelve or fifteen media in which he grew his micro-organisms, and those media were so totally different from those generally used by bacteriologists that he might be describing organisms which were thoroughly well known and continually being found, but yet could not be identified by others on account of the peculiar methods by which Dr. Choquet prepared his media. Another point Dr. Choquet hardly seemed to realize was that when an organism was first isolated from the human body, that organism took a certain period of time—it might be a week, a fortnight, or two or three months—before it attained what might be called its “laboratory habit.”

“AN ATTEMPT TO EXPLAIN THE SENSITIVENESS OF DENTINE.”

By Dr. Alfred Gysi, Zürich.¹

The author starts out with four fundamental propositions, in substance as follows:

1. No nerve-fibres have been found in the dentinal canals.
2. The dentinal canals are filled with a watery, organic substance, and exist in this form before a trace of nerve-fibre is to be demonstrated in the pulp. It is not probable that nerve-filaments grow from the pulp into the dentinal canals and displace the original contents.
3. At the inner border of the dentine about the odontoblasts a rich net-work of nerve-fibres exists.
4. From the science of physics it is known that water is prac-

¹ “Versuch zur Erklärung der Empfindlichkeit des Dentins.” Von Dr. dent. surg. Alfred Gysi, Zürich. Schweizerische Vierteljahrsschrift für Zahnheilkunde, Januar, 1901.

tically incompressible, and when confined in an unyielding tube pressure exerted at one end of the tube is transferred without appreciable loss to the other end.

From the foregoing premises the author argues that a pressure or a pull upon the contents of the dentinal canals is immediately transmitted to the odontoblastic layer of the pulp, and so affects the nerves of the pulp and causes pain.

Pressure on the contents of dentinal canals is commonly produced by excavating instruments, and the reverse force by the action of salt, sugar, and other substances which have a great affinity for the watery contents of the dentinal tubules. In order to diminish the sensitiveness of dentine we must in some way impair the capacity of the contents of the tubules for transmitting hydrostatic impulses caused either by pressure or the reverse of pressure. When the contents of the tubules are dried in any way, they become less able to pass along impulses to the nerves of the pulp. Also, when the albumin of the watery contents is coagulated by chloride of zinc, carbolic acid, or other substances, the same result is obtained.

The author believes it to be impracticable to undertake the coagulation or modification of the contents of the dentinal tubule in a short time,—viz., five to fifteen minutes. Only a very slight depth can be reached in the time usually given to the treatment of sensitive dentine previous to excavating it. The way in which he would manage a sensitive cavity is as follows: trim away overhanging enamel edges, dry the cavity, and apply Salier's dental anæsthetic. Seal in the latter with zinc sulphate cement. The patient is then to be dismissed until another sitting, at which time the case is usually found quite manageable. I have been unable to find out the composition of "Salier's dental anæsthetic," although I have written to the author for information on the subject. It appears to be a secret preparation made in Germany and sold commonly in that country. Its action would seem to be the gradual coagulation of the albuminous contents of the tubules, thereby making them unable to convey force impulses into the region of the nerves of the pulp. The author gives the composition of his zinc sulphate cement as follows: The fluid: sulphate of zinc, 1 part by weight; water, 3 parts by weight. The powder consists of unglazed oxide of zinc. It is especially fitted for sealing in cavities, temporary treatments forming a sufficient stopping for a

short time, and being easily removed. The expense of the cement is very small, and can readily be compounded by an apothecary.

Appended to Dr. Gysi's article are eight histological plates, which are intended to establish the non-existence of nerve-filaments in the dentine, and to force me to the conclusion that the sensitive-ness of dentine is due to the physical transmission of force by the contents of the tubuli to the odontoblastic layer of the pulp.

The author has given a very clear and useful exposition of the hydrostatic theory of the transmission of sensibility in the dentine, a theory which would seem to be a good working hypothesis, so long as the microscope fails to observe nerve-filaments. The adoption of this theory demands the use of sharp instruments in cutting dentine in order that all unnecessary force may be removed from the contents of the dentinal tubules, and it suggests a delicacy in the handling of cavities to which less accurate knowledge would probably be insensible.

The author's conclusion that a satisfactory modification of the sensitiveness of dentine cannot logically be expected in the few moments which the operator is accustomed to devote to it deserves careful consideration. The plan of applying medication and sealing it in the cavity for several days seems far more rational, and more consistent with the histological structure of the dentine.—
WILLIAM H. POTTER.

IMPACTED THIRD MOLAR IN A MUMMY.—Mr. William Hern showed to the Society and presented to the Museum some specimens of mummy jaw-bones (two mandibles and two superior maxillary bones) brought from Egypt by Mr. Blackden (to whom the Society is indebted for one of the mummy heads in its possession), who states that the bones are of extreme age, having been taken from tombs at Beni Hassan, where the doubled-up burials of the earliest inhabitants of Egypt are found.

One specimen, the mandible of a young adult, shows a well-marked impacted wisdom-tooth on the right side; this tooth is erupted in a semi-recumbent position, with its anterior cusps impinging against the distal surface of the second lower molar. The posterior surface of the crown is exposed to mastication, and a small, well-marked facet on the distal surface of the tooth shows that it has been in antagonism during mastication with the upper wisdom-tooth.

The teeth generally are sound, and about normal in size, although some, and especially the sixth-year molars, are much worn by surface attrition. On the lingual surfaces of the molars some thin ledges of salivary calculus are still attached. There is no sign of serious inflammation having occurred about the alveolar margin surrounding the wisdom tooth.—*Transactions Odontological Society of Great Britain.*

This interesting specimen of a human jaw, the age of which is estimated to be at least four thousand years, demonstrates very conclusively that at that early period in the world's history such a thing as an impacted molar was, probably, not uncommon. The position of the tooth, in the illustration given, is one quite familiar to all dentists of the present era.

The impaction of the third molar has been used as one of the arguments that the third molar is gradually undergoing a process of extinction as one of the regular series. While four thousand years may be a very short time in the history of the race and its evolution from one stage to another, it is a satisfaction to know that at that remote period the impacted third molar was not an unknown irregularity, and that it presented in form and position the peculiar characteristics of that tooth in the present age.—TRUMAN.

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held on Tuesday evening, February 5, at the office of Dr. J. Morgan Howe, No. 12 West Forty-sixth Street, New York, the Vice-President, Dr. A. H. Brockway, in the chair.

The minutes of the previous meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Suprarenal Capsules in Hemorrhage.

Dr. E. H. Raymond.—I would like to call the attention of the gentlemen present to the great value of desiccated suprarenal capsules, which I have been using for the past three months as a

hæmostatic. I feel that the preparation is so valuable that it is almost indispensable. Suprarenal capsules have been used constitutionally and locally for about six years by physicians and surgeons in many forms of inflammation in various parts of the body, also for hay-fever, hyperæmia, asthma, etc.

The suprarenal comes in the form of a tablet, powder, and aqueous extract. I have not found any agent that can compare with them for arresting hemorrhage, nor have I yet had a case where it has failed. While working in cavities between the teeth or around the cervical margins where the gums interfere by bleeding,—in fact, wherever we wish to arrest hemorrhage to enable us to continue our operations and not defer them to some future time,—this valuable preparation seems to meet all the requirements. A great advantage it has over the mineral styptics is that, being of an organic nature, there is no soreness nor sloughing of the parts after its use. Another advantage is that it possesses no disagreeable odor. I think the powder preferable to the aqueous extract, as the latter loses its potency in a few days. It is prepared from the suprarenal glands of healthy sheep. It does not seem to possess antiseptic or anæsthetic properties. Parke, Davis & Co. will supply samples and furnish clinical reports.

Dr. S. H. McNaughton.—Is it applicable in cases where there is excessive and continued hemorrhage, as after extraction?

Dr. Raymond.—I will answer the question by stating a case which I had yesterday. I found a loose root adjacent to a cavity which was very near the gum. I touched the gum with cocaine and extracted the root. There was profuse bleeding, which did not stop. Finally, I filled a pellet of cotton with the suprarenal capsule powder and placed it in the socket twice. The bleeding stopped almost instantly.

Dr. C. O. Kimball.—I would like to ask Dr. Raymond if the desiccation of the gum is so complete that gold may be used as a filling in its immediate neighborhood?

Dr. Raymond.—That has been my experience. I have never had any trouble with a recurrence of bleeding after one or two applications of the powder.

Dr. J. B. Locherty.—In regard to arterial hemorrhage, would Dr. Raymond apply it in these cases with pressure?

Dr. Raymond.—I have never had occasion to apply it with pressure except in one case, where I had a long, loose root to extract.

There was considerable bleeding and the patient was in a hurry. I placed some on a piece of cotton and applied with a little pressure, and after repeating this the bleeding stopped immediately.

Dr. Locherty.—Can Dr. Raymond tell us if this suprarenal capsule powder acts by contracting the blood-vessels or by forming a clot?

Dr. Raymond.—A clot is formed by the fibrin in the blood causing coagulation. The suprarenal capsules contract the blood-vessels.

Dr. Kimball.—We are very much obliged to Dr. Raymond for bringing this before us. It is a point which will no doubt be of much use to us. In this connection, the committee would like to ask the gentlemen of the Institute to be always on the alert for just such practical communications. Any point in his daily practice which any gentleman may think would be of help to others, the committee would like to have him feel free to present.

Cases of Replantation.

Dr. R. W. Hunter, of Greenfield, Mass., read a short paper entitled "A Few Cases of Replantation."

(For Dr. Hunter's paper, see page 313.)

DISCUSSION.

Dr. A. H. Brockway.—In what manner are these teeth retained in position?

Dr. Hunter.—By rubber dam and silk ligatures. A square piece of rubber dam has two holes punched in each end. Through these holes a silk ligature is passed making a sort of sling. The ligatures are then attached to the adjoining teeth. If there are no adjoining teeth some other means has to be devised.

Dr. S. E. Davenport.—Aside from the success which has attended Dr. Hunter's efforts, the most noticeable thing to me in the paper is the honesty of the essayist. I have attended many meetings of various dental societies, and I never before heard an essayist own that he had perforated a root. A great many perforated roots have been spoken of, but they had all been perforated by the other fellow. I explain this honesty of Dr. Hunter's when I remember that he is a Massachusetts man. I am glad to hear Dr. Hunter say that this should not be resorted to when anything else can be done. It seems to me that he will do well not to count too much upon the

success which he has attained in these few cases. When his hair is grayer or thinner he will have learned that there is a large element of lottery connected with this sort of operation. Regarding the method in which Dr. Hunter keeps these teeth in position, he has already told us that he shortens the root. I have wondered if the rubber dam splint applied as he has described does not have a tendency to shorten the tooth by pressure, so constant although slight, and that by the time the tooth is firm it is shorter than it should be.

Dr. Hunter.—I have not found it so. The pressure is very slight. I do shorten the end of the root, for the reason that I find it practically impossible to get the tooth back again in position unless this is done. Generally speaking, I remove the ligatures in about a week. The tooth even then is quite sore and a little loose. This looseness enables it to take the correct articulation, when it ultimately becomes firm.

Dr. Davenport.—In cases of chronic alveolar abscess, supposing Dr. Hunter were to resort to replantation, would he remove some of the diseased tissue from the socket first?

Dr. Hunter.—I have never done this in any case where I have resorted to replantation. The only treatment which I have given the socket was to wash it out with listerine and warm water. I think in most cases of abscess, if the irritating cause, the trouble at the end of the root, be removed, the abscess will heal.

Dr. L. C. Leroy.—In cutting off the end of the root, which Dr. Hunter says he does in all cases, does he allow the dentine to remain exposed, or does he cover it with some filling-material?

Dr. Hunter.—I simply cut off the end of the root and fill the canal with gutta-percha, and then polish off the end of the root as best I can with disks, finishing with a cuttle-fish disk.

Dr. Brockway.—Has Dr. Hunter, in the treatment of pyorrhœa alveolaris, where the teeth were exceedingly loose, ever resorted to extraction and replantation? I have heard that such practice has been adopted with success in some cases.

Dr. Hunter.—I have never performed replantation in a case of pyorrhœa alveolaris.

Dr. Wheeler.—I would like to answer Dr. Brockway's question. I recently had a very bad case of pyorrhœa alveolaris. One central incisor was an eighth of an inch longer than the other. There was nothing to do but to extract the tooth. I suggested, as an experi-

ment, that the tooth be replanted. Finding the pulp putrescent, I cut off the end of the root, filled the canal at the end with tin-foil, with a trephine cut the socket deeper, and put the tooth back in position, so that it was a little shorter than the other. I ligated it in position and left it for six weeks. The result was excellent.

Dr. Raymond.—Would Dr. Hunter attempt to replant teeth in the mouth of a patient where absorption of the alveolus had begun or was in progress?

Dr. Hunter.—If the absorption was only the absorption due to age, and not to disease, I see no reason why it should not be done.

Dr. J. Morgan Howe.—Speaking from some experience, I would say that replantation is a useful expedient as a last resort, as has been suggested by Dr. Hunter, especially in cases of pyorrhœa, affecting the teeth so as to elongate them, but where the socket has not wasted away to a great extent, where absorption has taken place only on one side of the socket, the other parts remaining comparatively intact. Such teeth can be extracted, the socket deepened, and the teeth replanted with success. I have done this successfully several times. I have one patient, a physician in this city, a man of fifty, for whom I have during the past five years treated three teeth successively in this manner with success. The last one was done two and a half years ago.

Dr. Kimball.—Did you find the same success in replanting teeth where the socket was partially absorbed and the tooth loose, and where there could be no hold upon the tooth for more than half the length of the root?

Dr. Howe.—I think results in these cases depend a good deal upon the condition of the patient. I have failed when patients have been anæmic, weakly, or aged,—past sixty. It has not been my good fortune to see reproduction of alveolar process, so that chances of success, I think, depend largely upon the amount of process still remaining.

Dr. C. D. Cook.—In this case which you have mentioned are there other teeth which are affected with the same disease?

Dr. Howe.—Yes, there are others, but I prefer to leave them where they are as long as they will stay. These are not operations to seek. As I have said, I think it advisable only as a last resort.

Dr. Gillett.—I would like to ask the President if he has noticed any recurrence in these teeth which have been replanted?

The President.—No, not as yet.

Dr. Gillett.—The statement has been made within a year or

so that teeth so replanted are not subject to pyorrhœa, and a case has been reported in which a tooth had been replanted to cure chronic abscess and subsequently every other tooth in the mouth except this one had been attacked by pyorrhœa.

Dr. Howe.—My experience in this case is that these teeth of the patient are the firmest which he has. It is probably only a question of time when they will get loose again, but in the mean time he is having the use of them.

Dr. Cook.—I suppose you have all noticed in cases of pyorrhœa that the teeth which have been devitalized are the ones which have remained firm. For this reason devitalization has been recommended in cases of pyorrhœa. I have seen this illustrated recently in the case of two molars side by side, one of which was devitalized but which was perfectly firm, while the other which was a sound tooth was very loose with pyorrhœa.

Dr. Gillett.—A case in which, about seven years ago, I replanted four teeth may be of interest. A child accidentally knocked out the upper right cuspid, lateral, and two centrals. The cuspid root was developed for only half its length. I replanted this tooth with the rest, filling the end of the root with tin-foil. To my surprise this cuspid tooth, with its root only half formed, became as firm as the others, and for a time the operation was successful, but it and the lateral came out in about two years. The two centrals were in position the last I heard. It seems to me that a point of real practical value is the preparation of the operating-room, having everything as sterile as if a major surgical operation were to be performed. I can sterilize my operating-room as thoroughly as would be desirable if an operation for appendicitis were to be performed. In this manner I have secured practical benefits with very much lessened soreness after replantation and a more satisfactory healing of the parts.

Relative Effect of a Common Environment upon Enamel.

Dr. Frederick L. Bogue read a paper entitled "Relative Effect of a Common Environment upon Enamel."

(For Dr. Bogue's paper, see page 293.)

DISCUSSION.

Dr. G. S. Allan.—The paper of Dr. Bogue's puts me in mind of a conversation between Sammy Weller and his father as stated

in "Pickwick Papers." The elder Weller had surprised his dutiful son just as he had finished a valentine to his dear Mary, and Sammy, as in duty bound, read his effusion to his father for advice and comfort. The document ended abruptly. "That's rather a sudden pull up, ain't it, Sammy?" inquired Mr. Weller. "Not a bit on it," said Sam. "She'll wish there was more, and that's the great art o' letter writin'." I think all will agree with me that the doctor's paper came to too sudden a finish, and that more would have been welcome. The paper touches upon a subject in which we are all very much interested, especially when taken in connection with Dr. Black's paper and his (almost) demonstration showing that environment is the only thing which is to be taken into consideration in studying caries of the teeth.

My impression when I read Dr. Black's paper was that his conclusions were pretty much the same as the Scotch verdict "not proven,"—that he did not take hold of this subject from all sides. We all know, since Dr. Miller demonstrated it, that the destruction of the teeth is caused primarily by germs, which in growing liberate certain by-products of an acid nature, lactic acid being the most common, and these, acting chemically on the lime-salts of the tooth, gradually destroy it. Of course, if this acid is weakened, or if it is mixed with other substances, its action is interfered with, either diminished or intensified; but to view this subject simply from the acid stand-point, and to say that environment only is to be considered, is not a fair statement of the question. The physical and chemical make-up of the tooth must in the nature of things equally influence the action that takes place, and as these vary in relative value in different cases, they are not constant factors.

There are so many elements which enter into the problem that it is hardly worth while taking up time discussing the question. If you dilute an acid the chemical reaction goes on with a certain degree of rapidity. Strengthen the acid, and instead of increasing the reaction it is retarded simply because there is not water sufficient to dissolve off the forming salts. Heat and various other things enter into the problem.

The chemical aspects of the case prove to us that, in spite of Dr. Black's statements, certain teeth are more affected by the same environment than others. Now, as I understand the results of Dr. Bogue's experiments, they strongly indicate that some of Dr. Black's statements need revision. The calcium phosphate of the

enamel is not broken up by lactic acid; the calcium carbonate is readily dissolved by it. The phosphate of lime usually greatly preponderates in the make-up of the enamel. I cannot conceive, however, how the relative proportions of these two substances could be ascertained in reference to its distribution in the enamel as well as in the dentine. Some experiments made by Dr. Wells suggest that the carbonate of lime is the cementing substance which holds the enamel-rods together, which latter are composed mostly of the phosphate of lime. This was shown by the fact that when the enamel was exposed to a solution of acetic or lactic acid, the prisms became separated. As this acid attacks only the carbonate of lime, it would seem to prove that this carbonate of lime is the cement substance of the enamel. I think some of Dr. Williams's experiments uphold this theory. And so this paper of Dr. Bogue's goes a great way, I think, to support the views of so many of us that there is something else besides environment to be considered in seeking a full solution of the philosophy of the decay of the teeth.

Dr. J. Bond Littig.—It has occurred to me that the former use of human teeth on artificial appliances may have some bearing on the case. There were marked differences as to the length of time which these would last in different mouths. The ravages of decay were such that in some mouths the teeth would be gone in six months. I was wondering, as the article was being read, whether the fact that these teeth had been devitalized would have made any difference. The fact remains, however, that these teeth were liable to decay sometimes quite rapidly. In other mouths they would seem to last for a considerable length of time.

Dr. Davenport.—In the October number of the INTERNATIONAL DENTAL JOURNAL there appeared an article by Dr. James Truman, the editor, which has made a great impression upon my mind. The title of the editorial was "A Season of Renewed Effort," and it was in part a plea for a better preparation of articles to be presented before dental societies. By better preparation Dr. Truman meant articles based on personal investigation. Theorizing, no matter how well it might be done, would not compare with the carefully chronicled results of investigation.

I think Dr. Frederick L. Bogue is deserving of great credit for what he has done in this direction. Incidentally he has placed credit upon the Institute, which he has chosen as the society before which these investigations appear. It is a matter of interest that

our two essayists to-night were both graduated in the same class from the University of Pennsylvania, and were under Dr. Truman's personal supervision. It has always seemed a little strange to me that Dr. Black should not have included the enamel in his investigations; strange that he should not have considered, at just as much length, the physical characteristics of the enamel as he did the physical characteristics of the dentine. I have thought the condition comparable to the removal of the armor from the soldier of olden times in order to find out how much prodding that soldier could stand without armor when he was accustomed to fight with it. Therefore I am particularly pleased that Dr. Bogue has chosen this field for his investigations, and, if I may divulge a secret, this paper, which to all of us as well as to Dr. Allan seems all too short, is, I believe, only the opening chapter. Dr. Bogue's experiments certainly prove something. The environment chosen for the second series of experiments was the same, and the difference of the action upon these enamel surfaces was so great that it proves to my satisfaction that there is a positive difference in the resisting power of enamel. Dr. Miller in his wonderful work of the last twenty years has often produced artificial decay. He has noticed that decay artificially produced sometimes progresses with far greater rapidity than it ever could in any condition of the mouth. This proved to Dr. Miller's satisfaction that the human mouth has some deterrent principle which retards decay, and Dr. Black, taking up the story at that point, wonders whether it is a microbe of a peculiar sort which neutralizes the effect of the microbes which form caries, or whether it is a chemical condition of the secretions. Just here the recent paper of Dr. Michaels, which was read before the International Congress at Paris, seems to me to be a key possibly to the whole situation. Dr. Black explains in his wonderful series of articles that the oral secretions have never yet been examined nor subjected to a consistent series of investigations to find out their influence upon the teeth. If the experiments begun by Dr. Michaels can be carried on, as I feel sure he will carry them on if he lives, the story will, in my opinion, be a much easier one for us to understand; and having diagnosed the case, we may be able to discover remedies for these conditions.

Dr. J. Morgan Howe.—I have been very much interested in Dr. Bogue's experiments, for he has allowed me to know something of them as they have been progressing during the past two

years or more, and I feel that the Institute has reason to be proud of Dr. Bogue as one of its members, because I regard the presentation of new facts obtained by investigation as of more value than pages and tomes of theories and personal opinions. The facts that Dr. Bogue has presented are of great importance because they must modify our views, which may have been greatly influenced by the announcements of the conclusions of Drs. Black and Williams. These gentlemen, original investigators, to whom we are greatly indebted for facts, agree in the judgment that the decay of teeth is practically due alone to environment and not to structure. In other words, that the physical and chemical make-up of a tooth made no difference, or practically no difference, but that all the variations in the inception and decay of teeth were due to the conditions of the oral fluids and the development and activity of bacteria. If these opinions are correct, it seems to be a necessary conclusion that the same environment would produce the same result on teeth of different kinds. Dr. Bogue's experiments, it seems to me, disprove that necessary conclusion. As Dr. Bogue has said, it at least puts the matter in the position of being an open question. It is to be hoped that Dr. Bogue will be able to go on with his experiments, furnish us with more facts, and thus give us a better basis on which to form conclusions. The probability is that environment has had a great deal more to do with the variations in the production of decay than we have ever believed heretofore. It is expected, and I believe we have reason to anticipate before long more definite information from Dr. Michaels, of Paris, with regard to the effect of the oral fluids in hastening or retarding decay. When we arrive at conclusions based upon all the facts which we are able to obtain, we will probably begin to consider these conditions from the view-point of specialists in medicine, and look for remedies which will influence oral fluids.

Dr. Kimball.—While I do not feel competent to discuss the paper from a scientific point of view, I cannot fail to express my appreciation of the work which has been done by Dr. Bogue and also to corroborate what Dr. Howe and Dr. Davenport have said as to the quality of the work. It seems to me that it is just such investigations which are to advance our profession in any definite direction. It is a very satisfactory thing to find one of our own men taking grounds against men whose position in the professional world is so well assured as that of Drs. Black and Williams, and

apparently with success. There was one question that occurred to me, whether he noticed any relation between the variations in decay which were produced and any of the recognized differentia; in other words, if, for instance, the specific gravity of the enamel corresponded in any way to the decay produced, or whether there was any differentiation in the enamels which seemed to correspond with the effect produced upon them in the same environment, thus giving us a possible clue as to the reason why some enamels decay more rapidly than others. I am glad to hear that Dr. Bogue is going on with his investigations, and hope we shall have the pleasure of hearing from him again. We shall watch for with interest and welcome with pleasure further reports.

Dr. E. A. Bogue.—The essayist has been properly careful not to make any pronouncement except where proof exists. The fact that the teeth of males contain a larger proportion of phosphate of lime than do the teeth of females, and, conversely, that the teeth of females contain a larger proportion of carbonate of lime, was announced at least fifteen or twenty years ago. That the acid in phosphate of lime has a stronger affinity for its base than any of the organic acids commonly found in the mouth is a chemical fact. It is also a chemical fact that carbonic acid in combination with lime has a weaker affinity by far than phosphoric, and that carbonate of lime is susceptible of disintegration and the reformation of soluble salts by the acids which may be formed in the mouth through fermentation. Our clinical experiences show that a great deal more work is done for females than for males. It is, therefore, not surprising that, with these facts before us, we should have jumped to the conclusion that the structure of the teeth themselves was a predisposing cause against or in favor of decay as the case might be. It ought to be a source of gratification to us to see this question carefully and scientifically examined, in order that definite conclusions may be reached, rather than to have it left for conclusions to be inferentially drawn from the few known facts.

In view of the subject of the evening we may be permitted to recall one fact not directly under discussion. It is emphasized by Drs. Black and Williams, as well as the essayist, yet, singularly enough, not one of them pronounces this fact in unmistakable terms. This fact is, a clean tooth never decays. Now, whether we investigate artificial decay or environment in general, or Dr. Black's hoped-for immunity to decay, or the felt-like plaques of Dr. Wil-

liams under which decay progresses, or the production of glycogen by the liver, which, changing into glucose and uniting with the ptyaline of the saliva, furnishes the lactic acid of Dr. Michaels, they all lead back to the same condition,—uncleanliness. That the saliva in its normal condition acts as a diluent, and thereby tends to preserve from decay teeth that are constantly bathed in it, is clinically shown by the great immunity to decay of the six lower front teeth. Lest city practitioners should not completely realize what this means, they have but to consult their country brethren to be assured that where total neglect of the teeth exists, these six lower front teeth remain in the mouth, comparatively or quite free from decay, after the loss of all the others.

Dr. Allan.—There is one remark in the discussion of the subject by Dr. Bogue to which I would like to take a slight exception,—namely, that teeth which are thoroughly clean will not decay. Clinically I know of apparently clean teeth that have decayed, teeth which have been kept so absolutely clean that it could not be said that they were not so. I have attributed these cases to the fact that there is something in the enamel which invites decay that is not apparent on the surface. I only state it as an exception to the rule. I believe in general that clean teeth do not decay; in fact, I have very radical opinions on the subject.

Dr. Howe.—I think Dr. Black, in an article that appears in the December number of the *Dental Cosmos*, practically made a similar statement,—that a clean tooth does not decay. He has reasoned that the portions of the teeth that are constantly rubbed by mastication are not the portions of teeth which decay, and it is those parts that do not get enough friction to keep them clean that decay. This fact has been in my mind for some time, and I have wondered that it has not been referred to before by men of science and men of practice. I think the apparent exceptions to the rule are only apparent. When decay occurs on apparently clean surfaces of teeth, upon careful examination such surfaces would be found covered with an adhering scum which harbors bacteria, thus generating the acid which is the inciting cause of decay, just as Dr. Williams has shown. I think we can realize how much environment affects teeth by noticing the difference in the beginning and progress of decay in the same individual at different times. The rapidity with which it occurs in the mouths of patients suffering with neurasthenia must have been noticed by most of us. Children

in school, young folk in college who are under pressure of their studies, business men, and women during gestation, or, under pressure of social affairs, becoming nervously exhausted, have dental decay manifested in greatly increased degree. We notice, too, in advancing years the same phenomenon. I think in every case we may attribute it to changes in the fluids of the mouth, which favor the proliferation of bacteria, and in their adherence to the tooth surface. But that these environments are not the only causes for differences in the inception and progress of decay we have demonstrated by Dr. Bogue's experiments.

Dr. F. L. Bogue.—I think Dr. Littig misunderstood me. The point I wished to emphasize was that it seemed probable that there were factors other than environment influencing the rapidity of the decalcification of enamel. Dr. Kimball asked if the specific gravity had any relation to the rapidity of decalcification. Up to the present time I have not been able to determine positively that it bears any relation.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology was held at the rooms of the Academy, 1731 Chestnut Street, Philadelphia, on the evening of Tuesday, February 26, 1901, the President, Dr. J. T. Lippencott, in the chair.

A paper was read by Dr. James P. Nichol, of Philadelphia, entitled "The Construction of Artificial Crowns."

(For Dr. Nichol's paper, see page 302.)

DISCUSSION.

Dr. I. N. Broomell.—I wish to emphasize one or two points which were brought out. The first one is that of using thin platinum as a backing. This is a method that I myself have employed for some time in almost the same way as the essayist. I have always been of the opinion that the force applied by the bending of the pins is the primary cause of checking. If the pins are riveted, a method which I believe is almost obsolete at the present time, the

pins are drawn from the body of the porcelain, and if they are bent over with force, this pulling effect on the body of the porcelain is also exerted. Therefore it seems to me highly important to bend the pins very slightly.

I wish also to endorse the little apparatus which has been exhibited for the purpose of swaging up hastily, skilfully, and successfully not only cusps, but many other small parts that we may occasionally be called upon to use. The water-bag gives one an opportunity of swaging directly on the plaster model, facilitates work, and brings out a very finely swaged form.

Dr. A. P. Fellows.—I wish to make mention of a mode of investment which I find very convenient, rapid, and in many respects better than that to which we have been accustomed to use. I make use of it in backing teeth. I usually finish my backing before a piece is completed. I back my tooth with pure gold 34 gauge, cut off the tooth pins to within a short distance of the backing, with a sharp instrument nick the edges of the pins, and then with a piece of hard or soft rubber swage the backing against the tooth. This will make it conform to the facing, no matter how irregular it may be, and without buckling. The investment is made by soaking a piece of asbestos paper and dipping it in water until it becomes a pulpy mass. The porcelain facing is pressed into the asbestos, and its edges are brought a trifle above the porcelain. I can immediately apply the blow-pipe without waiting for it to dry, and in a few minutes have a backing that is hard to excel for closeness. Having flowed upon this pure gold,—a 22-carat gold,—the entire back of the crown is of the same metal that the balance of the crown is made of.

I attempted last evening to make a backing in the way I suggest. I chose my tooth, made my backing, invested it, and soldered the metal on all in ten minutes, and I had a perfect backing and without any checking. I think checking is due altogether to excess of borax, and not to contraction of metals. If a very slight amount of borax, as small as you can possibly use, be put on the gold wherever you wish to add gold or solder, it is quite sufficient when a high-carat gold is used. With a low-carat gold or base-metal it is possibly necessary to use a quantity of borax; but in cases where pure gold or 22-carat gold is used, a small amount only is necessary, and it should never be allowed to touch the porcelain. I do not believe it is possible to break the porcelain. I find that by cutting

the pins very short indeed, when the piece is finished there is very little excess to dress off. When the pins are of full length the solder flows around them and fills the piece out too full. Cutting off saves a great deal of trouble, and the facing is perfectly firm. I believe it may even be cut level with the porcelain and still be strong enough.

In regard to seamless gold crowns and crowns which are to be had at the dental depots I wish to say just a word. I believe they are used largely, but I question very much, indeed, whether it is possible to get a good occlusion and a good fit around the root with such a crown. I do not see how it is possible to take a measurement of the root and choose a crown and fit that on correctly.

Dr. W. L. Ellerbeck.—I have a question to ask the essayist. I infer from his paper that he has subjected the facings of the different dental manufacturing companies to the furnace temperature, at their melting-point, without producing any checking or cracking. I would like to ask him if he ever ground the porcelains first and then subjected them to the furnace temperature to find out if that would have any effect on them?

Dr. Nichol.—I never subjected them after grinding, but I have seen facings that would break up in the fingers after being heated.

Dr. Ellerbeck.—Do you use dry or wet flux?

Dr. Nichol.—Both. In sweating up bands in crowns I like the wet flux, and I use flux called Sorosis. Of course, in uniting pieces of bridge-work, I think it is better to use the dry flux, because it is not absorbed by the investment.

Dr. S. H. Guilford.—It is a very encouraging sign that young men come forward and read papers before this society, as they have done for the past three or four months. I hope more will follow their example.

The paper was on a very practical subject, and has brought out several practical points. It is easy enough to describe the different kinds of crown- and bridge-work, but there are many things that we do not understand as fully as we should. One of these things is the causes of the cracking of porcelain. I have looked into that matter myself very carefully for a good many years, and have come to the conclusion that, in the great majority of cases, porcelains are cracked by the too liberal application of borax. Porcelain on crowns or bridge-work usually breaks in one or two directions. It will crack entirely through the tooth, either horizontally or ver-

tically, in the direction of the pins, or else it will crack parallel to the backing.

The causes of these two kinds of breaks are different. When the tooth breaks in the line of the pins I think it is due to the unequal rates of expansion of the platinum and porcelain. It was shown how the coefficient of expansion of the platinum and porcelain are about the same. If we heat them up the same, I do not see how it is possible to break the tooth, but if the platinum pins are heated and the porcelain cools before, then we have a case of fracture. Where we have a fracture parallel to the backing, I think it is caused by the borax getting through the pin-holes beneath the backing. Many have a larger hole than the pin requires, or the holes are enlarged to rectify an error in punching. That affords a good opportunity for the borax to get in. If the hole is nearly the same as the pin, the borax is not so apt to get beneath the backing. When the porcelain has broken off and the remnant is removed, one can see on the under side of the backing a distinct layer of solder, with its bubbled surface proving that the borax had gotten in and the solder followed. When the borax and solder get in you have something that comes in contact with the tooth that is much harder. The result is that that portion of the facing next to it is expanded and broken away. The other part remains, because the pin holds it. I now overcome that by this plan. After the backing is made and fitted to the tooth, I remove it and then adapt a piece of No. 20 or 30 foil gold, thin, over the back of the facing by means of a cork. The backing is then put on and pressed down, and the excess of foil trimmed off. By this means the borax is prevented from getting in between this layer of gold-foil and the tooth itself. In regard to the backing, I have found that there is nothing softer or more adaptable than what we are pleased nowadays to call platinum-gold or crown-metal. This material is made of gold and platinum rolled together. I put the gold side against the porcelain when I desire the light effect of the gold.

I endorse what Dr. Fellows said with regard to soldering. Many have the impression that after a tooth is invested all the moisture must be gotten out of the investment before attempting to apply the blow-pipe; whereas it has been shown that a wet investment is the best kind with which to solder, for when heated the hot water heats the porcelain. By putting asbestos paper on a tooth you can readily solder it at once.

As to getting occlusion of a tooth, more particularly a hollow metal crown, I recall a clinic in which a gentleman fitted a band to a root and trimmed it off to clear the occlusion of the opposing tooth; then he contoured the band, and across the occlusal end he soldered a flat piece of gold, No. 32 gauge. He cut out the central portion, leaving a hole. He swaged a thin piece of thin pure gold to the form of a cusp (using any form tolerably near what he desired). This he tacked in position with a bit of solder. He then placed the crown upon the root and allowed the patient to bite down upon it, then took it off and fitted the cusp more perfectly to the band and allowed the patient to bite again, by which means he secured a perfect occlusion. After that the cusps were reinforced with solder.

Dr. Joseph Head.—I was reminded of some experiences that would naturally come to one who has employed low- and high-fusing porcelains. I can hardly see that there should be any great danger of cracking during soldering, because there are hardly any teeth that I know of that are not fused at a point considerably higher than required in soldering, and carefully heating them again to a temperature considerably below the original fusing-point would in no way endanger their structure.

The point taken by Dr. Fellows that the investment-backing has no tendency to crack facings does not seem to be well taken. In my early experience with crown-work I attempted two or three times to carry the thin backing over the cutting edge of the tooth, and allowed the solder to flow over it, which made it of such rigidity that when the contraction of the solder took place it bit off the cutting edge of the crown as neatly as if I had used scissors. This fact would seem to indicate that, under certain conditions, the backing might be the cause of the checking of the porcelain. I think we have all noticed that where a tooth is surrounded on three sides by backing, and we are so unfortunate as to allow the solder to flow completely around that tooth and allow for the contraction of the metal, we are very likely to have serious checking.

What really brought me to my feet was the question of the liability of borax to crack porcelain. I think that is the real danger. I can give you my experience with it, and shall then give you a theory with which I am not wholly content, but it is the best that I am able to present, and will, therefore, be subject to your further investigation. I noticed that when joining the joints of

gum teeth with a high-fusing body the result was thoroughly satisfactory, and the high-fusing body could even be flowed outside of the joint so as to blend with the surrounding porcelain, but if by any chance the baking was not quite satisfactory, and I did not want to use a third or fourth firing, for fear something would happen, my brother and I thought it would be well to use a low-fusing porcelain on that; and almost invariably where we used the low-fusing porcelain the high-fusing porcelain would crack. That has been my experience, and I think we had the same experience when we used the borax.

Now, I shall give you my theory. The high-fusing porcelain is more or less porous. The low-fusing porcelain, when used as a glaze, becomes very much like glass. When they are both heated, the high-fusing porcelain, being porous, expands to a certain extent, but the low-fusing porcelain expands first to a greater extent, being liquid, and then when the cooling occurs contracts much more than the body below, thus causing a tension which may produce the cracking.

Dr. Fred. A. Peeso.—My experience has been that the cracking of facings is caused almost invariably by using too much flux. In crown- or bridge-work, where there is a broken facing, you will find that where the flux has worked through around the pins and under the backing the under side of the backing is covered with solder. I think that is the experience of almost every one. There are times with the central incisors where gold backing next to the tooth may be preferred, but I think that in the majority of cases very thin platinum is better, as pure gold backing next to a tooth shows through the enamel.

Dr. James Truman.—The theory that flux and borax will crack a facing seems to me contrary to the experience that some of us had during the earlier days when metal plate-work was exclusively used and when we knew nothing of crown- and bridge-work or rubber-work. At that time it was always my habit, in backing up teeth, to invariably coat the inside of the backing with borax, for the purpose of carrying the solder directly around the pins. Occasionally a tooth would crack, but, as a rule, we never expected such a thing as checking a tooth. In my judgment the trouble lies probably as much as anything else with the investment and with the rapidity with which it is heated. We were taught to invest properly and to heat the investment up to a certain point before

daring to place the flame upon the tooth. I do not see why a tooth should be cracked by heat if proper precautions are taken. I do not believe in the borax theory.

Dr. Louis Jack.—I might mention the method that was used in the days Dr. Truman spoke of. Then we made our investments of sand and plaster, but they were almost invariably gradually heated in vessels of charcoal to a red heat, and nearly to the melting-point of the solder, before the blow-pipe was applied. In that way we avoided the sudden application of heat and also the variable rates of expansion that would have taken place if the reducing flame were applied before the mass had become entirely hot. In many instances I have had a piece soldered in a charcoal receptacle entirely without the use of the reducing flame, and merely as the result of the gradual and full heating of the mass in the heated charcoal. In that way we would heat up block cases made up in three or four pieces. A block case, heated as now heated, would be invariably spoiled. It was necessary to heat or solder a block piece in the manner indicated almost to the soldering-point before the blow-pipe was put upon it.

Dr. Guilford.—I would like to ask Dr. Truman whether he coated the inside of the backing with borax, or whether he simply put it around the pin-holes?

Dr. Truman.—I coated the whole backing.

Dr. Guilford.—Did the solder flow in?

Dr. Truman.—Certainly.

Dr. Guilford.—I have never seen solder on the inside of the backing in a plate where the porcelain was cracked. I think in every crown or bridge the solder has been there. There is some reason for that.

Dr. Truman.—I never riveted my pins, always split them, and the solder will necessarily flow in between the pins and under the backing. It cannot be prevented.

Dr. Jeffries.—Dr. Truman's plan was mine exactly, and I did it for years that way, and always coated the inside of the backing with borax so as to allow the solder to draw through, and I very rarely had a cracked tooth. As to pin bending causing a strain upon the porcelain, it may be a good idea to flatten the pins with a file to enable them to bend easily.

Dr. Eugene Pettit.—I think ninety out of a hundred teeth are cracked by the backing running over the edge of the porcelain.

We find some irregularities of porcelain. The gold would be pushed down into them, and that is sufficient to cause cracking.

Dr. R. H. Nones.—It seems to me that there is a great difference between the terms “crack” and “edge.” A tooth that is cracked is altogether different from the tooth that is edged, and the tooth split directly through is, in most instances, due to too rapid cooling, or too rapid heating of that tooth, and not to borax. I must confirm what Drs. Truman and Jeffries have both said. I cannot go back as far as they, but it was my practice and that of Dr. Faber, with whom I was associated, to not only punch the pin-holes large, but to countersink them inside and out, so that the solder would go in beneath that backing and clamp the pin in place. With borax we would actually flood. Yet to-day, with bridge-work, I use more care than I ever attempted with plate-work and run more chance of edging the tooth. I do not find the trouble to lie in breaking directly through of the tooth, but in this edging. I think both Dr. Head and Dr. Nichol found the right idea when they said that the tooth is encased in metal, and has not the chance to expand or to move away from contracting solder. In backing I use pure gold more than platinum, but if I desire a grayish color I use platinum; if I want a yellow tint I use the gold.

Dr. William Trueman.—The essayist's method of fitting the backing seems to be rather complicated. The same result would be obtained much more accurately by the use of cornmeal. It is done in a very few moments, and backing can be used as heavy as 26 gauge and a perfect fit made. I have seen on the outside of such a backing the stamp of the numbers which the makers have upon the teeth.

I prefer in crown-work an alloy of gold and platinum,—twenty-two parts of pure gold and two parts of platinum. It is quite pliable, quite as much so as pure gold or pure platinum. It is a strong metal and does not show so much in the mouth; it has a peculiar gray color, and can be soldered with pure gold with safety; it is dense and takes a good polish. I find it satisfactory for making seamless crowns and for making caps in the porcelain-faced crowns. The essayist mentioned that by the sweating system a joint does not show. That, however, is not the case. I find it does show. Take a plate that has been sweated, put it under the blow-pipe, and you will see the line of union. After it has been worn it shows almost as plainly as solder. In the old time, when we got out our own

gold, in cutting the plate we could economize by having it joined, and in that case the joint always showed. Why, I do not know, but it always did. It has the advantage over soldering the joint that it does not open upon any subsequent soldering. The seamless crown, I think, is far superior to the one that is built up; it is very much easier to contour the block of plaster than the gold. We can get the contour, make it fit the root and also the place.

I have brought here a practical case and crown. It is very much like the Butler process. The root is cut down by the trephine, and then there is a draw-plate, by which a cap can be swaged up. Then the pin is soldered in the tooth and the tooth fitted. I have one here. It is for a practical case. These little caps all ready to fit can be made and kept on hand, and they fit accurately.

I was interested in the remarks made in reference to the old-fashioned way of soldering. My way was that as described by Dr. Truman. We finished the backing and spread it all over with borax, then took a camel's-hair brush and spread the tooth on the inside and put the backing in place. I can confirm what Dr. Truman said, that the accidents we have now were then comparatively rare. We placed the case in the furnace and heated it, and when it reached the critical stage, kept a watch on it. When the right time arrived the soldering was done as quickly as it would take time to tell it. Accidents were comparatively rare. I am disposed to think that teeth at the present time are not of the same composition, for they split when I let the borax get inside the backing.

Dr. James Truman.—I do not think the cause of cracking is in the porcelain. I have been soldering teeth all through my professional life, and have used a great variety of teeth manufactured under different formulæ. Another cause must be found for this checking.

Dr. W. L. Ellerbeck.—In relation to the matter of borax causing the cracking of porcelain facings, I feel in accord with Dr. Truman on that matter, and I can say that the borax, which we know of as sodium biborate, may unite chemically with the silicate of porcelain, causing a lower-fusing silicate. I cannot conceive how it causes cracking. If put upon the basis of a lower-fusing body, as suggested by Dr. Head, and the difference in contraction is the occasion for the cracking, I should say that the borax would crack and not the facing. It seems to me that if close adaptation could be secured, that would effectually prevent any borax from getting in.

Dr. Head.—Dr. Ellerbeck has made some interesting remarks about the borax uniting with porcelain and making a lower-fusing porcelain. That seems to me very interesting, but it has been the experience of porcelain workers that a very much lower-fusing porcelain flowed over a high-fusing porcelain tends to crack it. If the borax unites with the porcelain and forms a lower-fusing body, we would not have the borax to contend with, but the lower-fusing porcelain.

Dr. James P. Nichol.—I am still of the opinion that the greater majority of facings are broken up in the soldering. In view of the fact that I was to read a paper here to-night, as stated, I made a few experiments. I backed up some facings and invested them. I then put the investment on the furnace and heated it enough to lift the wax out in a piece. I then threw the whole flame of the blow-pipe on the backings and investment and checked two facings out of four. When I heated up the investment gradually, I did not have any checking of the facings. I did not use any borax at all in either case. In regard to backing up a tooth, there seems to be some difference of opinion in reference to the overlapping. I leave the backing a little bit low on the incisive edge. Answering Dr. Broomell in regard to splitting the pins and bending them down, I think a good many are broken by using the burnisher for bending down the pins. If you take the pin-roughening pliers and mash the pin, it is easy to bend it down without crowding it too hard against the facing. I may have conveyed the wrong idea in speaking about burnishing. We take an incisor tooth and let the backing stand out a little all around. Snip along the cutting edge, and if properly invested it will be held in position until soldered. I do not approve of the crown swaging methods, and would suggest that it would be a good point for younger men to try to manipulate metals rather than to swage them.

OTTO E. INGLIS,
Editor Academy of Stomatology.

Editorial.

IS THE RESULT WORTHY THE EFFORT?

THE readers of this journal are presented in this number with another budget of letters and communications from the Foreign Relations Committee of the National Association of Dental Faculties. This does not materially differ from that published in the April number, and is practically a continuation of the disagreeable subject of fraudulent diplomas. As a mere matter of news it may be interesting, but it is questionable whether it is good policy to spread these details before the profession.

The Foreign Relations Committee was originally appointed to secure information of the status of collegiate institutions abroad for the information of colleges in the United States. The committee quickly enlarged its sphere of labor and began unearthing the fraudulent diploma mills working under the very lax laws of the State of Illinois. This was not contemplated in the original appointment; in fact, the existence of such diploma factories was entirely unknown outside of the city of Chicago, and, probably, not extensively there. So secretly had the men who managed these concerns worked, that, so far as known, not a single diploma was ever disposed of in the United States. Their field of operation was entirely confined to foreign states. The work of the chairman of the Foreign Relations Committee in breaking up this nefarious traffic was of such a valuable character that the Faculties Association fully endorsed it and voted the necessary means to continue the work. It was supposed that this had been practically accomplished, and, with several of the principals in jail, that nothing more would be heard of fraudulent diplomas on this side of the water. This, however, seems to have been an erroneous calculation, for if we are to judge by the activity of United States Consul Worman, the investigation has only just begun, or, rather, perhaps, it has been transferred to continental Europe.

This transfer would possibly be a cause of satisfaction were it not for the fact that it gives the haters of the United States—and they are legion abroad—an opportunity to display their animosity to our institutions, and that with the most malevolent spirit.

As the case has stood from the first, the Foreign Relations Committee has been fighting not for our protection, but for the people of foreign nations. The fact is well known that it would practically be impossible in this country to practise upon one of these diplomas, and the people are not interested in the subject further than they would be in having all criminals placed where they could do no further harm.

While it is eminently proper to help our neighbors, it is a question whether this should be carried to the extent of doing ourselves a positive injury. That this is being accomplished is made evident by a careful reading of the partial report furnished by Consul Worman upon another page. The whole tendency seems to the writer to be to cause a wrong conception, in the foreign mind, of our methods of education, not only in dentistry, but in all other departments of scholastic training. Those familiar with Europe need not be told that a deep prejudice exists against all things originating in the United States, or America, as they please to term it. They will imitate our products, duplicate our inventions, but judge with extreme bitterness the race that produced these results. It is, therefore, certain that publicity given to these things that have occurred upon our soil simply opens the way for abuse, misrepresentation, and a further increase in the prejudice with those unable to discriminate between truth and falsehood.

This country, it is well known, has been heretofore, if not now, the dumping-ground for the criminals of Europe, and the men engaged in this nefarious traffic are foreigners, but this fact is not considered abroad. The evidence of this is to be found in all grades of crime, and it is to be noted in the correspondence published. Consul Worman says, "One of the deans of these institutions (Chicago) was sentenced to the penitentiary in Breslau, escaped to America, and was there forced to undergo a prolonged treatment in a penitential 'water-cure.'" The libeller of this country in Europe, however, takes no note of this fact. For his purpose it is sufficient that the deed be accomplished on American soil.

The average European, especially in Germany, cannot understand either our principle of government, or our educational methods. The idea of an independent government, or State sovereignty, within a central power is entirely foreign to his conceptions, and to have a system of education without a supreme head,

an educational minister at the seat of government, would be equivalent to no education at all. To these the incorporation of a college by a State is to place said college in the ranks with tradesmen who are obliged to procure a similar assent to open a store. We are judged, naturally, by the customs of each country, and the decision will invariably be against us. On the other hand, while we entertain great respect for the thoroughness of educational methods in continental Europe, the conditions are not the same here, and the system of training must always remain different, for the simple reason that our methods are the outgrowth of our needs and of our environments, and, while subject to change, can never, probably, partake of the same character, although reaching the same end, as those used in older civilizations.

It is, therefore, with some hesitation that space is given for this matter in this journal, as it will be certain to intensify the prejudice already existing in continental countries.

It must be apparent that as these fraudulent concerns are not injuring us, and are conducted by foreigners, that the Foreign Relations Committee is practically doing police work for the nationalities of Europe at the expense of the Faculties Association. It is a question whether this is wise, especially as it leads directly to the most foul slanders of everything regarded here as of value in education.

It would seem almost impossible to give exactly the truth abroad when this subject is up for discussion. This is made plain in the letter of A. E. Miller, of Chicago, taken from the *Zahnärztliche Rundschau*, Berlin. He says, "The writer, after graduating from a high school, attended the universities of Berlin and Leipzig, and was, as student and teacher, connected with colleges here [supposed Chicago], and may, therefore, be considered a competent judge.

"The so-called dental colleges, dental schools, etc., are, as a rule, private enterprises, and, according to the will of the Legislature, are not founded in the interest of science and humanity without yielding pecuniary profit to the managers. The words, 'incorporated under the laws of the State,' do not mean that the institutions are State institutions, but that they have been founded like insurance companies, large hardware concerns, liquor enterprises, etc.

"Therefore, the doctor's degrees of the college here are not to be confounded with the state diplomas in Germany, but would

rank with the apprentice certificates of any of the above-mentioned business concerns. . . . There is in every State 'a State Board of Dental Examiners,' whose duty it is, in the interest of public health, to see that no unqualified persons are permitted to practise dentistry."

Could there be under the guise of truth a more satisfactory method of inculcating error than this writer manages to invent for the purpose, apparently, of libelling his supposed country and its institutions. He makes it appear that dental colleges are alone incorporated by the State, when he knew, if he knew anything, that all educational and professional institutions must take the same course, and from that source receive authority to grant degrees.

"These dental schools are not founded in the interest of humanity, but are business projects and for profit." This will be news to the managers of dental colleges, with very rare exceptions. The majority are kept alive, if not with a dead loss, with only sufficient income to meet current outlay. This veracious writer, in dealing with the truth, should have stated that possibly the State of Illinois was unique in having an incorporation law differing, in all essential provisions, from other States, and as it stands, or did stand, is an ever open door to a repetition of all sorts of frauds, professional and otherwise.

The effect of such a missive published in a prominent German journal may readily be conceived. Probably not a reader but at once made up his mind that professional dental education in America was a roaring farce. Who can estimate the injury this writer has done to the educational work in this country?

We are presented in this collection with another sample of a different character from the foregoing. The writer of this evidently meant his screed as a peculiarly fine sample of sarcastic writing, or an exhibit of German humor; in any event, it resolves itself into a quite perfect specimen of Ananias culture in the make up of the author. It is taken from the *Basel Vorwärts*, March 12, 1901.

"The doctor factory in Philadelphia, which, as is well known, on the payment of several hundred dollars, helps every one to a doctor title, is now so crowded with work that, to furnish the paper for doctor diplomas, eight large paper-factories are working day and night uninterruptedly, and even then thousands of aspirants for the doctor title must be turned away daily or put off

for future years. Among the applicants for the coveted title are numerous ladies; the modern American lady knows no higher ambition (or has no higher pride) than to place Dr. before her name."

Attempts to answer such a monumental prevaricator and wholesale libeller of American women would be out of place, but for those who know foreign thought and foreign lack of information concerning America it need not be stated that every word of this infamous screed would be accepted as truth by the Basel subscribers of that sheet. The truth is that not a single fraudulent diploma has been issued in Philadelphia since the notorious Buchanan, many years back, was jailed by the authorities. Not only this, but, outside of Chicago, the writer does not know of any diploma mills, and even there the proprietors are fast being housed in the penitentiary.

In view of this, why will the Foreign Relations Committee insist upon allowing these foreign libellers access to all the dental journals of this country. The INTERNATIONAL DENTAL JOURNAL reluctantly opened its pages, and would have declined to be a party to this had it not seemed necessary that the dental profession should be informed of the trend of affairs in this direction and the dangerous quagmire into which we are certainly drifting.

It is time, in the writer's judgment, for the Foreign Relations Committee to seriously consider whether it is not stepping beyond, and very far beyond, the duties contemplated by the Association of Faculties. The police authorities should treat these criminals as they do others and as the United States detective service did the other day in running down a foreign counterfeiter, who was found well equipped for manufacturing foreign bank-notes. These diplomas have been made here by foreign criminals for foreign consumption entirely, and, while we should give neighborly help, it is the duty of the foreign states to seek out and punish their own criminals, and not make them a charge upon innocent peoples, and it is certainly not the business of the dentists of this country to do this work for them.

The United States has its own civilization, its own methods of education, its own laws regulating this, and its own people to care for and educate, and it will brook no interference or insolence from the narrow-minded European whose view is limited to what his grandfather taught or his great-grandfather invented.

Miscellany.

OXYPHOSPHATE OF COPPER.—Dr. Mansell, in his report to the *Dental Record* of the proceedings of the International Dental Congress of 1900, at Paris, makes mention of a new filling-material,—Ames's oxyphosphate of copper. It consists of a liquid and powder, and is mixed and used like other cements. The powder, unfortunately, is black.

This cement is very plastic and sets quickly at the temperature of the mouth. It is especially suitable for filling temporary teeth, first permanent molars, and almost inaccessible cavities, and for setting shell crowns. Dr. Ames claims that it is not necessary to remove all the softened dentine in filling, as the oxide of copper sterilizes and hardens it. It will, if placed over an exposed pulp in a temporary tooth, prevent it from suppurating. If mixed thin, it will flow into fissures and pits and adhere firmly. The filling must be trimmed quickly, because it is very hard and difficult to cut when thoroughly set.

Dr. Ames believes it will prove of great value in setting crowns, because it will be less liable to become foul than ordinary cement. It has not been used long enough to test its lasting qualities.

A DURABLE CEMENT.—Dr. W. W. Flora, of Carthage, Mo., has in his possession a specimen of bridge-work that had been done by a native dentist of India fifty-three years ago, in which the dentist had used natural teeth. They were attached to the bars by gold wire running through the length of the teeth and soldered to the bars. A cement was used that had stood the test fifty-three years with perfect color, something that is a marvel to the modern manufacturer of cement.—*Western Dental Journal*.

A NEW METHOD OF MAKING DIES.—The *Ohio Dental Journal* gives a method of making metal dies described in "Dental Clippings" as follows: A plaster impression is taken of the mouth, but instead of waxing up the pieces, they must be set to place with cement. The impression is then boiled for ten or fifteen minutes

in beeswax. While still hot the surplus wax is drained off, taking care that none of the finer lines have been filled, the idea being simply to fill the pores of the plaster. A piece of sheet wax—beeswax is best—is built up around the tray to the height of the desired die. The whole is now given a thorough coating of dry graphite, the difficult parts being reached with a fine camel's-hair pencil. This is electro-plated with copper to about the thickness of a visiting-card. Molten zinc can then be poured into the matrix thus formed. In order to avoid accidents, it is best to set the impression in a dish of sand when the zinc is run.

The counter-die can be made of any of the metals or alloys used for this purpose, as the copper fuses at a very high temperature.

This method is especially applicable where there are undercuts, doing away with "cases." It gives a die which cannot be duplicated for accuracy; and although it takes some time to describe it, the whole process takes but a very little time. It can be plated over night, and in the morning the die can be run.

Obituary.

DR. THEODORE F. CHUPEIN.

DR. CHUPEIN died at his residence, Philadelphia, March 23, 1901. His health had been perceptibly failing for some time, but the end came with startling suddenness to his friends.

Dr. Chupein was born in Charleston, S. C., September 7, 1830. He was educated in the schools of that city, and to this training he added the results of a lifetime of continuous study. This enabled him to grasp with facility the many problems that confronted him in the practice of his profession.

He was placed by his father with Dr. William Stockton Monefeldt, a dentist of reputation in Charleston, who entertained some of the old-time notions that a man to be a good dentist should begin by cultivating manual dexterity, and in order to effect this in the young student he kept him at carving teeth out of ivory blocks for over a year of his novitiate, although that method of preparing artificial dentures had long been obsolete. This ap-

parently useless practice was, however, an important part of his training, for to it, probably, Dr. Chupein owed that mechanical ability that gave character to his work throughout his life. He remained with Dr. Monefeldt for five years as student and assistant, and in 1852 began practice for himself in Charleston.

At the commencement of the Civil War he became a member of the Washington Artillery, of Charleston, and served as sergeant in the Confederate service during the entire period of the conflict, being stationed, at garrison duty, at Adams Run, near Charleston. The commandant at one time being in need of the services of a dentist, and finding Dr. Chupein well qualified, he was selected to act as dental surgeon for the men in the garrison, a duty he fulfilled to the satisfaction of the officers and men, although oftentimes compelled to make his own instruments at the army forge.

During the war his family removed to Philadelphia, and at its close he joined them, obtaining employment with Dr. J. D. White, then the most prominent dentist of that city, and had charge of his mechanical laboratory.

He received the degree of Doctor of Dental Surgery from the Pennsylvania College of Dental Surgery, March, 1872.

He subsequently returned to Charleston, and, in connection with his practice, opened a dental supply house, at that time a great convenience to the dentists of that city. He eventually suffered, in 1875, the entire loss, by fire, of his office and supply department. The following year he again established himself in Philadelphia, where he remained up to the day of his death.

During all this period from 1876 to 1901 he was an untiring worker in the dental ranks of his adopted city. He united at once with the Pennsylvania Association of Dental Surgeons, and subsequently became an active member of the Odontographic Society, since disbanded. He was also a prominent member in the Odontological Society, and was, at a later period, elected an honorary member of the Academy of Stomatology of Philadelphia.

He was made Secretary of the Pennsylvania Association of Dental Surgeons in 1877, and was continued in that office up to the time of his death.

In 1887 he was made editor of *The Dental Office and Laboratory*, published by Johnson & Lund. Dental readers have been made familiar with his practical suggestions upon its pages; in fact, this publication was almost entirely made up from his pen.

He prepared the chapter on "Artificial Dentures on Bases of Fusible Alloys" for the "American System of Dentistry."

In 1890 he published a small work entitled "The Dental Laboratory," full of practical suggestions.

Dr. Chupein lived an active and yet ever an unobtrusive life. He seemed to be almost entirely devoted unselfishly to his profession. The writer rarely ever met one more willing to sacrifice self in the interest of dentistry. His long and varied experience had taught him ways and means to overcome difficulties, and these he was always ready to impart to those needing assistance.

He was thus naturally an ever-faithful worker in the organizations with which he was connected, but his love seemed to be centred in the Pennsylvania Association of Dental Surgeons, and it was largely through his persistent effort that that society managed to tide over a long and almost lifeless period to the present, when it has renewed its youth and now promises something worthy of its earlier life when Townsend, White, Arthur, Neall, and others made it famous among dental organizations. The recrudescence of this organization he was happily permitted to see before he passed away.

Dr. Chupein was honored in his adopted city as a man not only of marked ability in his profession, but one true to his highest conceptions of duty. The motives which actuate some men are at times difficult of solution, but with Dr. Chupein there was no secrecy, no suspicion of an underlying selfish motive. He was always true to those higher principles, as he understood them, which not only made him the good citizen, but the earnest professional worker.

He married, in 1858, Miss Virginia M. Phol, of Philadelphia. He had six children, and a widow and three children survive him.

DR. HENRY J. McKELLOPS.

A MESSAGE from St. Louis, as we go to press, announces the death of Dr. H. J. McKellops. This will be sad information to Dr. McKellops's many friends throughout the country, for it has been given to but few to be better known or more generously appreciated. Full notice of his life work is deferred until the June number.

Current News.

FOREIGN RELATIONS COMMITTEE OF THE NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE Foreign Relations Committee, to whose jurisdiction has been referred certain foreign educational matters affecting the interests of the National Association of Dental Faculties, has been in receipt of a great mass of correspondence concerning the status of the distinctive American dental degree in Europe, and the effect upon public opinion there of the almost open sale of diplomas issued by fraudulently conducted but regularly chartered schools in the State of Illinois, and their quasi-recognition by the Illinois State Board of Dental Examiners, who, it is charged, have admitted to the State dental examination and granted permits to practise to foreign possessors of these irregular degrees obtained, in some instances, after their having been in this country for less than a month.

At the last meeting of the National Association of Dental Faculties, upon the recommendation of the Foreign Relations Committee, the work of the suppression of the irregular and fraudulent schools was placed in the hands of the Committee on Law, but as the first-named committee is in constant communication with American and other dentists abroad, and with our own government and its officers, in relation to the condition of the American degree in foreign countries, it has been deemed best, at the suggestion of such correspondents, to furnish our dental journals with abstracts from a few of these communications, that the profession in America may be made aware of the consequences resulting from the vicious character of some of the Illinois legislation. The first instalment of this was furnished without comment to the principal journals for their April issues, and the following is in supplement to that. The committee is necessarily dependent upon our professional magazines for this courtesy, and it is glad to say that all have expressed a hearty willingness to aid in the good work to the extent of their power.

W. C. BARRETT,
Chairman.

(Copy.)

UNITED STATES CONSULATE,
MUNICH, February 25, 1901.

DR. W. C. BARRETT,

*Chairman Foreign Relations Committee, National Association
Dental Colleges:*

ESTEEMED SIR,—I have the honor to acknowledge your letter of the 9th inst. The work undertaken by me is to bring me no other reward than the restoration to honor and acceptance everywhere of the American degree in dentistry, than which no other country merits it better.

The report of the committee you sent I had read ere I prepared my last despatch sent to the government at home and here, and in my recent despatch mailed last week to Washington I supplied evidence against one of the supposed *suppressed* institutions, the old "Academia Illinois;" the diploma dating from May 24, 1899, although obtained much later and issued by Dr. B. E. Winkler and Dr. B. I. R. Ungelenk. Of the diploma as well as the notary's certificate (which is *printed*, as you will see, so that the notary only had to write in his own name) I hand you photographic copy herewith for further use. The whole case will, of course, be duly reported to you from Washington, and I think will undeceive you as to all parties of the nefarious traffic being in jail.

You will oblige me if you will kindly state the names of all the parties thus far arrested, and promptly have me informed of any new one added to those jailed, as it is all-important that we have these names registered here.

Very respectfully,

(Signed)

JAMES H. WORMAN,
Consul.

(Enclosures.)

1. Copy of diploma of Academia Illinois to Bosch. Signed, Dr. B. E. Winkler, Pres., Prof. Op. Dent.; B. I. R. Ungelenk, Sec., Prof. of Chem.

2. Kreuker's certificate as notary.

3. Copy of letter from the police here.

CONSULAR SERVICE, UNITED STATES OF AMERICA,
MUNICH, GERMANY, February 12, 1901.

DR. W. C. BARRETT,

208 Franklin Street, Buffalo, N. Y.:

DEAR SIR,—Just now a very peculiar case is up here, and I am anxious to have your assistance at once. Under this date I write to the State Board of Illinois as per enclosed, also to the Secretary of the Board of Health of Illinois, addressing him at Springfield and requesting two copies of the annual report or of the law as amended for examinations by the State board, to be certified to by the Secretary of State *and the German Consul*. This is all-important.

This Gumpoldt has *no* Roumanian degree, and was in the United States only a few weeks, possibly only a few days. I know when he went and returned. He has a diploma from Weil and two certificates from the State Examining Board, as my letter to Reid discloses, both referring in date and contents, Weil having been the interpreter. Our German Consul in Chicago has notified the courts here that the Illinois Board is competent to grant such certificates, and that the signatures of three make it a *bona fide* certificate. The law requires annual meeting for the granting of licenses. Members of the board can only grant temporary certificates, renewal necessary, and registration in County Clerk's office within six months, all of which was *not* done.

Yours truly,

(Signed)

J. H. WORMAN,
Consul.

No. 48.

CONSULATE OF THE UNITED STATES OF AMERICA,
MUNICH, GERMANY, February 13, 1901.

HON. DAVID J. HILL,

Assistant Secretary of State, Washington, D. C.:

SIR,—Most respectfully referring to my despatch No. 38, under date of December 29, 1900, regarding the sale of dental degrees in Germany and to the preceding communications from this Consulate to your Department on the same subject, I have the honor to report further:

[The first part of this despatch of Consul Worman, of New York, consists of a review of what has been previously reported concerning the "Academia Illinois," of Chicago, and the "Wisconsin College of Dentistry," of Milwaukee, both of which have

been suppressed, and of extracts from the report of the Foreign Relations Committee made at Omaha, July, 1899, in which the enormity of the foreign diploma traffic on the part of certain Chicago institutions was fully set forth. This is omitted as having been substantially published before.]

The German dental journals have exposed and denounced the swindling institutions fraudulently issuing diplomas, but so indifferent are the German authorities to protect the dignity of American degrees that it is difficult to enlist them for prosecution that will restore American dental honors to the distinction to which they are entitled.

In 1897 the *Journal für Zahnheilkunde*, XII. Jahrgang, No. 42, review a prospectus of the "Academia Illinois" which they had secured from Chicago, and thoroughly exposed its illegal business and the worthlessness of its diplomas. (A copy of this article and a translation are hereto annexed marked Exhibits J and K.)

(An exhibit to the same purpose marked L from the *Zahn-ärztliche Rundschau*, Berlin, July 15, 1900, page 6860, is also hereto annexed. A translation of the same is marked Exhibit L 1.)

To what low estate American university training and honors have fallen in Germany on account of this disgraceful traffic is perhaps better apparent from these technical journals than from the manner in which the subject is treated by the secular press, and even by the comic journals.

Can any American of spirit sit idly by and see such disgraceful caricatures launched against educational enterprises, and that with justification by reason of such want of supervision on the part of so great and cultivated a State as Illinois, whose chief city where this nefarious traffic centres has a reputation to lose as well as to make, second only to the metropolis of our great country?

(A cartoon from the *Lustige Blätter*, showing a penny-in-the-slot diploma machine, is hereto annexed, marked Exhibit M.)

This publicity has not always treated of the swindling institutions alone, but has very often generalized the whole subject, not only of American dental degrees, but all American educational honors, and has created in the minds even of educated Germans a prejudice against our institutions of learning which is as unfortunate as unjust, and is proving and will prove still more in the future detrimental to American practitioners in Germany, and

probably lead ultimately to the exclusion of American degrees in South Germany, like in the north, where their holders are practically denied the right to use or practise under them. (See Exhibits K 1, K 2.)

The courts of North Germany have had until recently much more to do with this question than those of the Southland, and the manner in which they have commented upon our educational institutions, though largely due to want of understanding of the organization of these schools, has nevertheless reflected the general unfavorable opinions entertained here. Such expressions of eminent men could have but helped to strengthen and confirm the prejudices of those of lower estate.

It is simply a question of time, and that not so far away, when the courts of the Southland will re-echo these same unjust sentiments, if the flood-tide of public opinion is not promptly stemmed by discriminate and effective legislation at home. It will not do for the legislators of the State that has brought such disgrace upon our common country and good name to plead impairment of interests, which have become incidentally vested under vicious legislation, as a reason why no more effective measures have prevailed against the nefarious traffic and its disgraceful results.

The statement of Dr. W. C. Barrett, Chairman of the Foreign Relations Committee of the National Association of Dental Faculties (see Exhibit 11½), that thus far the National Association of Dental Faculties has failed to carry through such legislation as the conditions exact, is best supported by citation of court reports here.

A very recent expression from the criminal court of Breslau, although restricted to the "Academia Illinois," no doubt influenced a judgment rendered by the District Court of Nuremberg, and caused a most indiscriminate and wholly unwarranted denunciation of the "Chicago College of Dental Surgery," one of the most reputable of American schools. (A copy of this decision and translation thereof are hereto annexed marked Exhibits M 1 and M 2.)

The judgment in Breslau was given in July, 1900, and probably the charter of the "Academia Illinois" had been revoked, but the court did not seem to care to discriminate between extinct and existing institutions.

An English rendering of the decision is as follows: The professors of the "Academia Illinois" were tradespeople, policemen,

etc., who did a flourishing business by trafficking in diplomas in all professions, and sent their swindling advertisements to dentists abroad, unfortunately not always without success. One of the deans of these institutions was one Abert, sentenced to the penitentiary in Breslau, escaped to America, and was there forced to undergo a prolonged treatment in a penitential "water cure."

What the Committee on Foreign Relations of the National Association of Dental Faculties said as far back as 1898, at Omaha, surely goes to the root of the matter.

Their report expressed the earnest hope "that as soon as the professional men of the State of Illinois are aroused from their lethargy and made to comprehend the enormity of the conditions, they will present the matter before the Legislature in its proper light, and the disgraceful law will be so amended that it will not apply to educational institutions, and the charters already issued under it will be very promptly cancelled."

It is evident, from what has been heretofore said, that this good work has not yet been accomplished.

As here truly said, however, the remedy lies at home, and I hope at a very early day to most respectfully submit some suggestions that will be practical as to procedure in Illinois, obtained as the result of the criminal trials and investigations by the Attorney-General's office here; and perhaps also regarding diplomatic representations that seem to be called for to put an end to the prejudicial part taken in some of the cases by the Imperial German Consul in Chicago, or his subordinates in his name.

I have the honor to be, sir, your obedient servant,

(Signed)

JAMES H. WORMAN,

United States Consul.

EXHIBIT.

(Translation.)

MUNICH, December 17, 1900.

TO THE CHIEF OF POLICE:

In the matter of Franz Xaver Bosch, for using here the title of Doctor of Dental Surgery.

In reply to your letter of the 24th ultimo, I beg leave to state that the "Academia Illinois" still has the right to issue dental diplomas, but is known to have abused such privileges, and will not be permitted to exercise the privilege much longer.

The issuing of such diplomas is only permitted when the appli-

cant has pursued a regular course of study of several years, and has passed a formal examination.

Even under the most favorable circumstances, a thoroughly qualified candidate would not be admitted to examination at one of our reputable dental colleges unless he had pursued his studies there for at least six months. According to the new regulations, the candidate is admitted to examination only after eighteen months of study in the college where he wishes to graduate.

The institution in question is said to have issued diplomas to applicants on payment of a certain sum of money, who have not complied with these preliminary requirements, as has been proved at the trial of Emil Gumpoldt, in the Criminal Court No. 2, at Munich, on December 10, 1900.

The holders of diplomas like the one issued to Bosch cannot even practise in America.

Such diplomas are mainly used abroad to deceive a public unable to discriminate between such and those approved by the United States Commissioner of Education.

The American government is assiduously striving to suppress these spurious institutions.

There are only two still in existence,—viz.:

1. The Cosmopolitan Post-Graduate College of Dental Surgery at Chicago.

2. The German-American Dental College, also at Chicago.

I, therefore, respectfully request you to have the diploma in question confiscated and transmitted to me, and vouch for its return. I desire to send it to the United States Commissioner of Education, in order to furnish official evidence that such a spurious diploma was issued by the said institution. The Commissioner of Education would then be in a position to pronounce on the illegality of the diploma, and to take steps to suppress the institution.

The anticipated reply of the State Department will be given without delay, since I have already called its attention to these swindling institutions, and have had not only its approbation of my action in the matter, but have been instructed to co-operate in the settlement of this affair with the government here.

I have the honor to be, sir, your obedient servant,

(Signed)

JAMES H. WORMAN,

United States Consul.

(Here follows as "Exhibit I" a copy of an article from the *Dental Cosmos* of July, 1900, page 700 of vol. xlii., under the title, "A Slump in the Diploma Traffic.")

EXHIBIT.

(Translation.)

(From the *Journal für Zahnheilkunde*, No. 42, 1897.)

A CHAPTER ABOUT DOCTORS OF DENTAL SURGERY.

For some time past eulogies of the latest swindling institution, the "Academia Illinois," have been circulating in Germany.

To-day accident has thrown into our hands a prospectus of this "institute." The swindling intent is so apparent in this circular that he must, indeed, be dumb who could fall into its hands.

At the same time we have received information from Chicago that the postmaster there has been instructed not to deliver letters and money remittances addressed to the "Academia Illinois," but to send them to the Dead Letter Office in Washington, to be returned to the writers and senders, as according to American law the mails cannot be used for fraudulent purposes.

To avoid this prohibition, this worthy crowd has pasted over the address of the "Academia Illinois" on the circular and given the address of a boarding-house lodger who has no actual residence there, to enable them to continue the swindle and enhance the difficulties of the prosecution.

In order to escape the effect of the law of April 7, 1897, regarding the necessity in Prussia of ministerial permission to use a foreign doctor's degree, the president, whose signature appears on the circular, has the audacity to assume that this "rag" which he calls a diploma would be acknowledged in Prussia. (He calls himself in the circular "Magnificenz" and "Rector Magnificus.")

We have, on the part of our society, sent properly certified copies of this circular, as well as the information received from Chicago about this swindling concern, to all proper officials, to place a bar to the use of this diploma which the notarially certified documents from Chicago cannot and will not break through.

In the circular the president calls himself "Magnificenz," and names among the "Founders" four victims, three in Germany and one in Brussels. We hope that these pilloried gentlemen will soon find out that they themselves have been swindled, and will

not lend themselves to the stool-pigeon service which is attributed to them in the circular.

(From the *Neusten Nachrichten*, Munich, February 6, 1901.)

THE RIGHT TO THE TITLE "AMERICAN DENTIST."

The dentist Emil Gumpoldt, who acquired the title of "American Dentist" in America, advertised as such in several newspapers, and had a sign made bearing that title. December 10 of last year Gumpoldt had to appear in court to account for the title which he had no right to claim, and was sentenced to five days' arrest or a fine of twelve dollars and fifty cents.

The court of justice has taken the matter in hand, and the American Consul, Mr. J. H. Worman, was present at the transaction, as witness and competent judge. Mr. Worman asserts that the certificate which Gumpoldt received (from the Illinois State Board of Dental Examiners), and which he claims entitles him to "American Dentist," is not genuine, as it should be signed by a board of examiners of five members. Gumpoldt's certificate shows but three signatures, and is therefore only provisory, or not valid. If the certificate were genuine and signed by the full number of censors, it would pass for a "license of trade," and only entitle the holder to practise in the State of Illinois (where it was issued). The certificate bears the signature of the German Consul at Chicago,—not as a competent judge, however, but to confirm that the wording of the German copy is genuine. A diploma such as Gumpoldt pretends to possess Mr. Worman considers a fraud of individuals whose principal aim is to rob foreigners, and Gumpoldt claims to have become their victim, and his case should serve as a precedent to his colleagues.

The Consul states that such diplomas cannot be granted by law unless the student has lived in America a certain length of time and has passed through a course of studies. Mr. Worman considers it his duty to oppose such frauds, and has taken steps to insure the punishment of such swindlers by his government.

The testimony taken showed that Gumpoldt arrived in the city of Chicago in the spring of 1900, obtained a diploma and the degree of Doctor of Dental Surgery from the "Cosmopolitan Post-Graduate Medical College," was admitted to and passed the examination of the "Illinois State Board of Dental Examiners," re-

ceived a license to practise in the State of Illinois, and returned to Germany, leaving Munich after the middle of April and arriving back again early in June of the same year, having been gone but little more than four weeks. He had never previously pursued any course of dental study.

EXHIBIT.

(From the *Zahnärztliche Rundschau*, Berlin, July 15, 1900.)

AMERICAN DOCTOR'S DIPLOMAS.

BY DR. A. E. MILLER, OF CHICAGO.

The European and more especially the German Dental press has within the last few years taken up the question of American diplomas, and so much has been written about it, without giving any accurate statement of the conditions prevailing in America, that I am prompted to give an impartial elucidation of American college institutions.

The writer, after graduating from a high school, attended the universities of Berlin and Leipzig, and was, as student and teacher, connected with colleges here, and may, therefore, be considered a competent judge.

The so-called dental colleges, dental schools, etc., are, as a rule, private enterprises, and, according to the will of the Legislature, are not founded in the interest of science and humanity without yielding pecuniary profit to the managers. The words, "incorporated under the laws of the State," do not mean that the institutions are State institutions, but that they have been founded like insurance companies, large hardware concerns, liquor enterprises, etc.

Therefore, the doctor's degrees of the college here are not to be confounded with the state diplomas in Germany, but would rank with the apprentice certificates of any of the above-mentioned business concerns. There is this difference, however: while the State in the exercise of the police power does not concern itself as to whether apprentice certificates of hardware concerns are based on truth, and does not vouch for the qualification of their holders, it manifests an interest in those young people who have received a doctor's diploma and are desirous of practising dentistry, to see that their diplomas do practically guarantee the qualification of the holders. Therefore there is in every State a "State Board of Dental Examiners," whose duty it is, in the interest of public

health, to see that no unqualified persons are admitted to practise dentistry. This is carried out by subjecting all candidates to an examination, no matter whether they have attended a college or not. From this examination are only exempt such as are in possession of a doctor's diploma from institutions whose reputation warrants a thorough qualification of the respective holders of diplomas and who have obtained their licenses to pursue the practice of dentistry by virtue of their diplomas.

IMPERIAL GERMAN CONSULATE,
CHICAGO, June 28, 1899.

In regard to your letter of the 11th of this year, I write to state that the Cosmopolitan Post-Graduate College is permitted by law to give the degree of Doctor of Dental Surgery after passing examinations. The course lasts from eleven to thirteen weeks, and is not arranged in classes. The directors of the college, Dr. Weil and others, have a good reputation so far as I know.

If the degree given in this college has the same value as those given in other colleges, I am not prepared to say. I have neither means nor opportunities to investigate the many institutions which exist in this country and which are not under our control.

Concerning the value of American doctor diplomas in Germany, you can best be informed in Berlin.

The Imperial Consul,
(Signed) F. A. LETTENBAM.

(From the *Basel Vorwärts* of March 12, 1901.)

The Doctor Factory in Philadelphia, which, as is well known, on the payment of several hundred dollars, helps every one to a Doctor Title, is now so crowded with work that, to furnish the paper for doctor diplomas, eight large paper-factories are working day and night uninterruptedly. And even then thousands of aspirants for the doctor title must be turned away daily or put off to future years. Among the applicants for the coveted title are numerous ladies; the modern American lady knows no higher ambition (or has no higher pride) than to place Dr. before her name.

PROF. DR. W. C. BARRETT:

DRESDEN, January 30, 1901.

HONORED PROFESSOR,—The Society of Graduate Dentists in Dresden sends you a copy of one of the Cosmopolitan Post-Graduate College diplomas. With this diploma they receive the title

of doctor (D.D.S.). The Society of Post-Graduate Dentists in Dresden consider this title worthless. We beg, dear doctor, that you explain to the German Consulate at Chicago the value of this college, that they may send us an official statement of its worthlessness as speedily as possible, and that we may deal justly with the Consulate. The Foreign Relations Committee has already been notified.

In one of your letters to Dr. Miller, of Berlin, were some very interesting facts about the Cosmopolitan College. We hope it is possible for you to obtain the official statement for us, and that the college, which we have no doubt has been closed by the law, and the director of the college shall meet with their reward.

It will then be an easy matter to persuade the Ministerium in Saxony of the worthlessness of the college and to obtain the punishment of these gentlemen.

Believe me, with very great respect, and the compliments of the Society of Graduate Dentists of Dresden,

(Signed)

BOENHERR.

(Translation.)

DR. W. C. BARRETT:

DRESDEN, January 14, 1901.

DEAR PROFESSOR,—Your kind letter and the report of the Foreign Relations Committee were received a short time ago. Allow me to thank you most sincerely for having sent the explicit account to our colleague, Dr. Boenherr. Our association has carefully weighed and considered the letter, and is confident we are now able to take a further step in doing away with the diploma swindlers in Germany, as well as to unmask the bearers of the false title of "Cosmopolitan Post-Graduate College of Chicago."

It is difficult to understand how it was possible that the "Ministerium" should acknowledge the title after the very superficial examination, and, moreover, how it could be permitted that the bearer of this diploma could make use of the same. Thanks for the excellent proof that we now have, owing to our colleagues. We sincerely hope that we shall be able to convince the officials of the falseness of the title, and thereby do away with this swindle, especially since it is of vital interest to the whole dental world.

As soon as this matter is settled we shall not fail to send you and all our colleagues in America an accurate report. So far we have not secured the official certificate of the German Imperial Consulate of Chicago, by aid of which we can readily overcome all

difficulties. Although we made known to the Consulate of Chicago about nine months ago the facts concerning the existing condition of the "Cosmopolitan College," we received an evasive rather than an explanatory answer. This made us consider the matter seriously, if not suspiciously; in fact, to such an extent that we may report the deficiency to the "Chancellor's" office in Berlin.

It seems impossible that the Consulate should be ignorant of the worthlessness of the said college, when you, as well as Dr. Brophy, Dr. Kirk, and Professors Miller and Hesse, of Germany, have given us such definite information. We have also reports from the following sources: *Dental Cosmos*, March, 1899, page 287; *Items of Interest*, No. 7, July, 1899. Can you in any way explain why the German Consulate of Chicago gave us such unsatisfactory answers?

You would confer a great favor on us by giving us an official document about the "School of the Cosmopolitan Post-Graduate College." Of course, we shall pay all expenses in connection with this.

Sincerely yours,

(Signed)

C. BLOCHMAN,

Society of Graduate Dentists of Dresden.

To W. C. BARRETT,
Chicago:

DEAR PROFESSOR,—Your kindness requires especial thanks. I hope that your explicit document will make an impression upon the ministerial offices.

It may be of interest to you to know that the Saxon Minister received a favorable report from the German Consul regarding the questionable college, and said Consul at Chicago is therefore not free from complicity. We must therefore be under great obligations if you could obtain a proper document from the general Consul in Chicago, telling us of the quality of said college.

Yours,

(Signed)

YOENKEN, D.D.S.

EXHIBIT.

MUNICH, January 5, 1901.

DR. J. G. REID,
Chicago, Ill.:

ESTEEMED SIR,—I am informed that you are president of the Illinois State Board of Dental Examiners.

(1) Will you, as such, kindly inform me whether candidates for the practice of dentistry in your State are not obliged to have pursued a course of study, for at least a short period, in some school of dentistry before being admitted to examination before your board?

(2) Kindly reply how it comes that certificates are issuing with Dr. Smyser as secretary and Dr. Jocelyn as president of your Board of Examiners?

(3) Are certificates complete and legal if issued without the signature of yourself or of Dr. Pitner, if issued September, 1900?

An early reply is most respectfully requested.

Very truly yours,

(Signed)

JAMES H. WORMAN,

United States Consul.

EXHIBIT.

STATE BOARD OF DENTAL EXAMINERS,
CHICAGO, January 22, 1901.

JAMES H. WORMAN,

United States Consul, Munich, Germany:

HONORED SIR,—Your letter of January 5 addressed to me as President of the Illinois State Board of Dental Examiners was duly received. While I am not the president of the board, I am its secretary, and such correspondence is usually delegated to such officer to answer.

(1) Candidates for examination do not have to present credentials of any kind to be admitted before the board. Any one who may desire can come before the board irrespective of how much or how little knowledge he may possess on dental subjects. The board determines his qualifications after the examination.

(2) Licenses bearing the signatures of only three members of the board can only be explained on the ground that the former secretary did not send the license to Dr. Pitner or myself for signing, and the majority of licenses abroad would not have been signed by us any way, especially those issued during the past two years.

(3) To my knowledge the courts of this State have never passed upon the question of the requisite number of names that shall appear on the document to make it legal. From what we see, one is led to suppose that three names are sufficient to make it legal. The law says in plain terms that the license shall be signed by the members thereof. So long as I remain secretary of the board

no license will appear in your country without the required number of names.

There are times when the board might be vacant for some time. There are times when a member of the board could not be reached, hence his signature could not be obtained, but these are only exceptional cases, and not general.

I enclose you with this letter a copy of the law, that you may familiarize yourself.

Any further information you may desire I will gladly furnish if within my power.

Very respectfully yours,

(Signed)

J. G. REID, D.D.S.,
Secretary.

UNITED STATES CONSULATE,
MUNICH, GERMANY, February 7, 1901.

DR. J. G. REID,

*Secretary Illinois State Board of Dental Examiners, 1006
Champlain Building, Chicago, Ill., U. S. A.:*

DEAR SIR,—Please accept my thanks for your prompt answer and your kind explanations, as well as for the enclosure with your favor of 22d January. Kindly favor me with two new copies of same. May I now hope to have your answer to the following queries:

(1) Why was one Emil Gumpoldt granted a license to practise dentistry in Illinois under date of May 5, 1900?

(2) Why was the paper signed by only three members, and why was a new issue of this certificate made in September?

(3) What evidence of fitness did he furnish for such licensing, and why do the two certificates differ in contents?

(4) Have these certificates any value so long as they were not filed in the County Clerk's office within six months?

(5) How came it that Dr. Weil, himself interested in "graduating" students in dentistry and the head of a suspected institution and excluded from the list of reputable colleges, was permitted to conduct the examination of said Gumpoldt, or at least to assist as an interpreter?

(6) Are the examination papers of this candidate on file at your office, also his diploma?

Kindly give me answer by return post and oblige,

Yours truly,

(Signed)

J. H. WORMAN.

AMERICAN MEDICAL ASSOCIATION, SECTION ON STOMATOLOGY.

THE next meeting of the American Medical Association will be held at St. Paul, Minn., June 4, 5, 6, and 7, 1901. The Section on Stomatology presents the following programme:

Chairman's Address. R. R. Andrews, Cambridge, Mass.

SYMPOSIUM ON STATE BOARDS OF DENTAL EXAMINERS IN THEIR RELATION TO THE PROFESSION AND THE COLLEGES.

1. Methods of Appointment: (a) By State Universities, New York; (b) By State Boards of State Officials, *ex-officio*, Nebraska; (c) By Governors on Recommendation of the Profession. William Carr, New York City.

2. Revenue for conducting the Work of the Boards of Examiners: (a) By Taxation of the People; (b) By Fees from Examination of Candidates; (c) By Taxation of the Profession. George L. Parmele, Hartford, Conn.; V. E. Turner, Raleigh, N. C.

3. The Dental College Standard: (a) Is it what it should be? (b) If not, what Improvements should be made? (c) How may the Requirements be improved? Charles Chittenden, Madison, Wis.

4. Licensing: (a) By Examination; (b) By Diploma. J. A. Libby, Pittsburg, Pa.

SYMPOSIUM ON DEGENERACY OF THE PULP.

1. Preliminary Work. Eugene S. Talbot, Chicago.

2. Literature of the Pulp. Vida A. Latham, Roger's Park, Ill.

3. Cutting, Staining, and Mounting. Martha Anderson, Moline, Ill.

1. Local Anæsthesia. A. H. Peck, Chicago, Ill.

2. A Remedy for Certain Injustice both to the Insured and the Company. W. E. Walker, Pass Christian, Miss.

3. Periods of Stress and their Dental Marks. Jas. G. Kiernan, Chicago.

4. Surgical Treatment of Cleft Palate. G. V. I. Brown, Milwaukee, Wis.

5. Persistent Neuralgia after Root Filling. E. K. Wedelstaedt, St. Paul, Minn.

6. Infectious Diseases. Alice Steeves, Chicago.
7. Simple Gingivitis. Geo. T. Carpenter, Chicago.
8. Military Dental Practice: Its Modifications and Limitations. Henry D. Hatch, New York City.
9. The Tongue as a Breeding-Place for Bacteria. M. H. Fletcher, Cincinnati, Ohio.
10. Pathology of the Alveolar Process. Eugene S. Talbot, Chicago.
11. Tuberculosis of the Alveolar Process and Surrounding Tissues and a Few Methods of Differential Diagnosis. V. A. Gudex, Milwaukee, Wis.

The officers of the Section invite all to be present and take part in the discussions.

Those who desire to join the Association must obtain credentials from their State or local dental societies and pay five dollars to the secretary of the Association. This will entitle them to the Journal for one year.

R. R. ANDREWS,
Chairman Section on Stomatology.
EUGENE S. TALBOT,
Secretary Section on Stomatology.

NOTICE.

WAR DEPARTMENT, SURGEON-GENERAL'S OFFICE.

CANDIDATES for appointment as Dental Surgeons in the United States army will be examined in the following-named branches: Anatomy, Physiology, Histology, Physics, Chemistry, Metallurgy, Dental Anatomy and Physiology, Dental Materia Medica and Therapeutics, Dental Pathology and Bacteriology, Orthodontia, Oral Surgery, Operative Dentistry, Theoretical, Prosthetic Dentistry, Theoretical, Operative Dentistry, Practical, Prosthetic Dentistry, Practical.

An average of seventy-five per cent. will be required in each subject for Theoretical Examinations, and eighty-five per cent. in the Practical Examinations.

(Signed)

JOHN S. MARSHALL,
President Examining Board of Dental Surgeons.

TRI-STATE DENTAL MEETING.

THIS will be the largest meeting of the summer, and one of the best. All roads run to Indianapolis, and every dentist in the United States, who is conducting his practice in a legitimate manner, is urged to come and break bread with us. We do not care whether you are a member of a State Association or not if you "do unto others as you would they should do unto you."

The third triennial meeting under the auspices of the State Associations of Ohio, Michigan, and Indiana will occur June 4, 5, and 6, 1901, at Indianapolis, Indiana. The German House, corner of Michigan and New Jersey Streets, has been secured for the meeting and exhibits. The Central Passenger Association has granted a round-trip rate of a fare and a third, on the certificate plan. Any inquiries addressed to 131 East Ohio Street, Indianapolis, will be cheerfully answered.

For further information address,

GEORGE E. HUNT,
Chairman.

131 EAST OHIO STREET, INDIANAPOLIS, IND.

ILLINOIS STATE DENTAL SOCIETY.

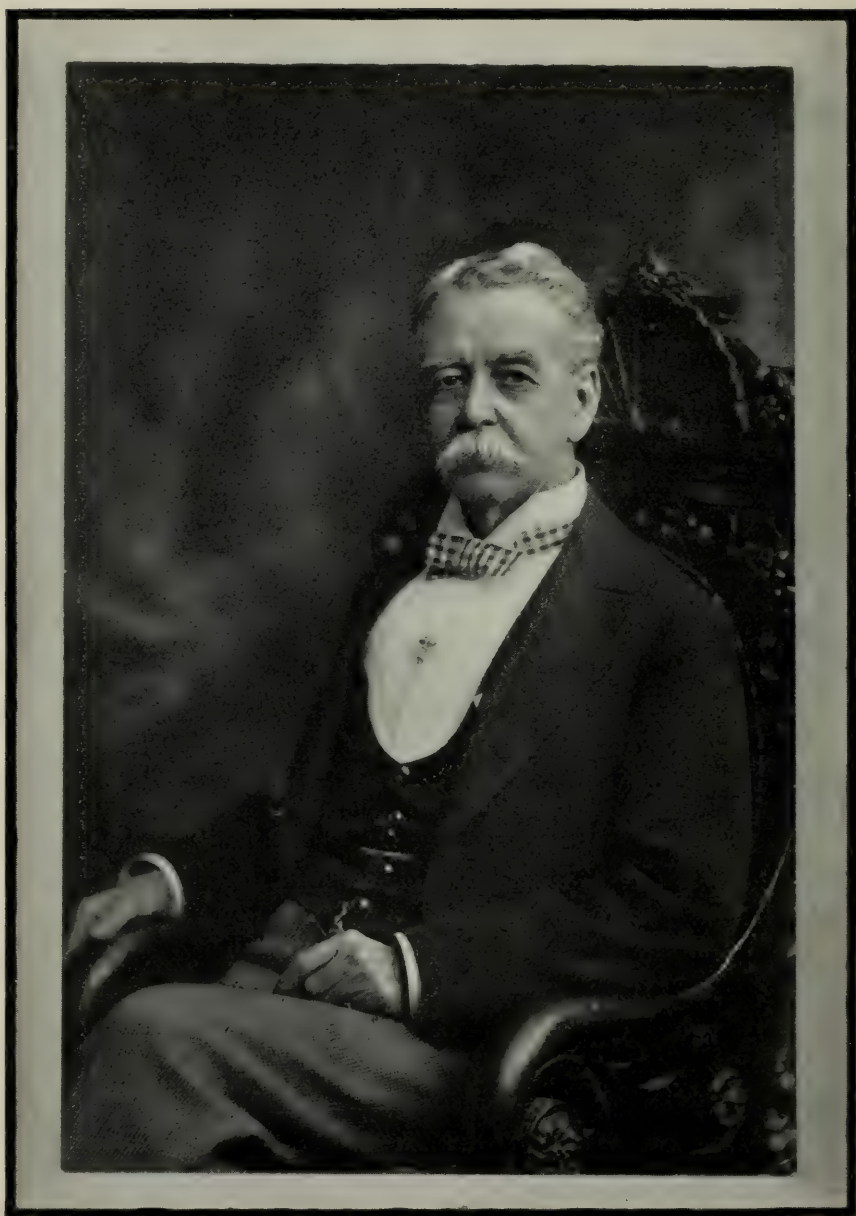
THE thirty-seventh annual meeting will be held in Rockford, May 14 to 17, inclusive. All members should make an effort to be present. The Society is always glad to welcome reputable dentists, who are not members, from this and other States.

The local committee has arranged for an informal reception on Tuesday evening in the parlors of the hotel Nelson. A short programme has been prepared, and all in attendance are cordially invited to be present and spend a sociable evening.

C. R. TAYLOR, Streator, Ill.,
Chairman Executive Committee.

J. E. HINKINS, Chicago, Ill.,
Supervisor of Clinics.

[The programme of this meeting is quite lengthy, covering sixteen papers and reports, with forty-six clinical operations. It is with regret that space will not permit publication in full.—ED.]



DR. HENRY JAMES BYRON McKELLOPS
ST. LOUIS

THE International Dental Journal.

VOL. XXII.

JUNE, 1901.

No. 6.

Original Communications.¹

MALIGNANT GROWTHS IN THE MOUTH, INCIDENTAL TO GENERAL PRACTICE.²

BY GEORGE A. MAXFIELD, D.D.S.

At a meeting of this Institute in April, 1899, Dr. Dawbarn presented a case of sarcoma of the antrum, and commenting on the case Dr. Dawbarn said, "If the dentist who first had the case had recognized the disease and had referred the patient to the proper surgeon, the extensive operation then necessary might have been prevented. As a similar case had come into my hands only a few months previous, a member of your Executive Committee suggested that I make a brief report of a few cases that have come under my observation, thus helping to emphasize the point which Dr. Howe has so often referred to in these meetings,—viz., the necessity of the dentist's ability to recognize malignant growths when first seen, so that the patient may be referred to a competent surgeon in the early stages of the disease.

Although these cases occurring in the mouth and adjacent parts are not common, they are of such rapid growth, generally, that the

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology, March 5, 1901.

time lost—by ignorance on the part of the dentist in the early stages of the disease—has rendered the life of the patient beyond recovery. Three cases of carcinoma have come into my hands during the past seven years.

CASE I.—March, 1894, Mr. C., farmer, aged seventy, face badly swollen with fistula on under side of jaw directly under the left second molar, which had been discharging for several weeks, came in by advice of his physician to have some teeth extracted, as it had the appearance of an alveolar abscess.

On examination I found the teeth badly affected with pyorrhœa alveolaris and very loose. I extracted two molars and two bicuspid, and a careful examination failed to reveal any connection with the fistula through any of the sockets of the extracted teeth. A probe was then passed into the fistula for over two inches. The patient was referred back to the physician, who sent him to the hospital, where it was pronounced carcinoma. An operation was not thought advisable on account of his advanced age, and he died there some five weeks later.

CASE II.—Mr. W., aged seventy-one, came in the first week of December, 1896, to have a tooth extracted. Examination revealed all the teeth badly affected with pyorrhœa alveolaris, the left inferior second molar quite loose and giving considerable pain, the first molar and both bicuspid missing, and nothing to indicate any other trouble. The second molar was extracted. The second week in January, following, he came in again to have the left inferior cuspid extracted, as this was giving pain. I found it quite loose, and also noticed a small growth—cauliflower-like—in the socket of the molar I had previously extracted. I extracted the cuspid and directed him to call two days later, when I could give him more time. He did not keep the appointment.

Two weeks later, on meeting his niece, I informed her of the serious aspects of the case and the necessity of immediate attention. The day following he came in. I then found the growth in the molar socket had increased in size, projecting above the gum, also a small growth in the socket of the cuspid, the gum near the molar having become ulcerated on the upper surface. The growths bled very easily, and had been staining the pillow every night, and had been giving much pain. I injected the growths with carbolic acid, ninety-five per cent. strength, and removed them, and after thoroughly washing the parts with a weak solution of the acid, I applied

a dressing, on a pledget of cotton, of carbolic acid, one part, and glycerin, two parts, and ordered fifteen drops of the same in a glass of water, to be used freely as a mouth-wash. I also prescribed Fellows' hypophosphites. I saw him every two days for a week, when I simply washed the parts with hydrogen dioxide and followed with the same dressing as the first time. The improvement was then so marked that I directed him to continue the treatment at home and to call again in one week.

I next saw him February 18, when I noticed the growth returning in the molar socket. I removed it this time by injecting the tincture of iodine. He then informed me he was going away to visit relatives, as he had suffered no pain since I first removed the growths, nor had there been any hemorrhage. Contrary to my advice, he went away, and I did not see him again until March 12. He was then in excellent spirits and had had no trouble while away. On examination I found the growths had returned, filling both sockets and rolling over the gum, but without ulceration. I then informed him that I was unable to help him, as I felt certain it was a malignant growth. After consulting with his friends he was sent to the Massachusetts General Hospital at Boston, where after a microscopical examination it was pronounced carcinoma, but on account of his age the surgeons did not think it wise to operate. When he returned home, March 15, he assured me he was going to cure the cancer by the use of a decoction made from some roots and herbs, which he called a blood medicine. When I saw him again, six weeks later, May 1, I was surprised to see the marked improvement in his general health, while the condition in the mouth was about the same as when he returned from the hospital. I did not see him again; he died the last of the following November.

CASE III.—Mr. B., aged forty-two, was a strong healthy man, who never had had any sickness. While away from home the left superior third molar became somewhat loose, and felt so uncomfortable that he went to a dentist and had it extracted; then, as the troubled feeling continued, he returned to the dentist for treatment. After treating the case for two weeks the dentist extracted the first and second molars adjoining, as he said they were irritating the cheek, told him he had leucoplakia, and continued to treat the case five weeks longer, when the man became so ill that he returned home. The physician called in brought him to me and left him in my charge. This was on December 14, 1898.

On examination I found the cheek somewhat swollen, with inability to open the mouth more than half an inch; the gum on the buccal side much swollen, ulcerated, and hanging down, when the mouth was closed, between the lower teeth and cheek. The alveolus was also exposed and the parts emitting a bad odor. In appearance it resembled cases that have come into my hands of sloughing, as a result of hypodermic injections for extraction, though he assured me that the dentist had not made any injections. At first I thought it might be a case of infection from dental instruments, as the rest of the mouth was in a healthy condition. I washed the parts as thoroughly as possible with hydrogen dioxide and applied the carbolic acid and glycerin. I ordered for home treatment the parts to be sprayed every half-hour through the day with a mixture of equal parts of hydrogen dioxide and Phillips's milk of magnesia, followed by the carbolic mouth-wash. The next day, Thursday, he reported the best night's rest for six weeks. I treated as before, and on Friday there was a marked improvement and absence of all odor. I ordered the home treatment continued, and did not see him again until Monday. I then found the odor returning and pus exuding on the surface. I also noticed on the palatine margin of the gum of the socket of the third molar a small growth, not larger than the head of a pin, cauliflower-like, which at once aroused my suspicion that the trouble was from a malignant growth in the antrum. I ordered the same home treatment continued. When he came in the Wednesday following, there was a slight increase in the size of this growth, and I sent word to his physician.

The following Monday, December 26, we sent him to Dr. Maurice Richardson, of Boston, who confirmed our diagnosis, but said it was too late for an operation, and advised his going to Dr. Coley, of New York, and taking the antitoxin treatment as his only hope. On Thursday he went to Dr. Coley, who, after a microscopical examination, pronounced it carcinoma, but did not give much encouragement regarding the treatment, as the disease had so far advanced. Treatment was begun, however, and at first there appeared to be a marked improvement, but by the end of the third week it was evident the treatment was simply retarding the growth, and he came home the last of January. After this no other treatment was attempted. He died the first day of May, only four months and a half after I first saw him, and only about six months after the first appearance of any trouble with the third molar.

In this case, if the dentist had referred the patient to a surgeon before he extracted the other two molars, instead of attempting to treat what evidently he knew nothing about, I firmly believe the patient's life might have been prolonged.

SOME NEW APPLIANCES.¹

BY HARRY F. HAMILTON, D.M.D., BOSTON, MASS.

A NEW TOOTH-BRUSH.

MANY years ago I had my attention called to injuries to the gums and teeth caused by excessive use of the tooth-brush. I have since then observed carefully all the cases which came under my care, and have seen many where the teeth have been practically ruined and their usefulness destroyed years before they should have been merely by the conscientiousness of the patients in trying to keep them clean and guard against caries.

I have seen the gums brushed away over a quarter of an inch in three months, and come down over the places again upon the brushing being stopped. In many cases the gums have come down three-sixteenths of an inch on prohibiting all brushing for a limited time.

Unless one observes carefully, and takes impressions and measurements, these injuries are not thought of, except as a natural recession, but if the dentist will think how few of these sharp loaf-sugar-shaped recessions are to be seen in the mouths of those never using the brush, he will realize what a danger it can be in willing but unskilful hands.

The gum over the left superior cuspid is the first to go, then follows the left superior and inferior bicuspid and the right superior cuspid, and then the left superior lateral, and so on through the whole mouth. The right superior lateral is not harmed until about the last, as it is not reached easily by a brush in the right hand. Later the gums in the interproximal spaces give way from the friction and from losing the support on the labial surfaces, and we have food crowding in and causing decay. It is at this time the

¹ Read before the American Academy of Dental Science, March 6, 1901.

patient complains of the amount of work to be done, as he has always brushed his teeth many times a day.

A general irritability is set up by the vigorous friction, so the patient is not comfortable unless he has had his scrub after every meal. Patients always assure you they brush carefully, often saying they brush up and down and not across, but the marks are there and cannot be explained away. In many cases I have had to prohibit the use of the brush altogether, a thankless task until the patient becomes interested in the gradual covering of the unsightly places.

The gum is soft and spongy at first, but gradually hardens to its proper density. To remedy this abuse I tried prescribing the badger-hair brush. With a few persons this is a success, but it must be used without pressure, as most persons bear on hard and the hairs part in the centre and become merely a mat. To avoid this I have had the brush made which I submit for your inspection. It has alternate tufts of badger-hair and bristles, the latter being considerably shorter, their office being to give firmness and support to the badger-hair tufts. (The badger-hair tufts are shown at A, the bristle tufts at B, Fig. 1.)

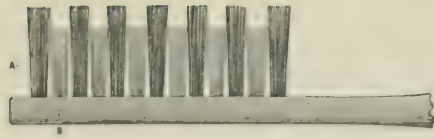
The brush is not intended for general use, but for those patients who have this tooth-brush recession, or are in a way to have it. It should be supplemented by the use of a cloth over the end of the finger, with powder, once or twice a week.

I find it difficult to coax the gums down in patients over forty, although occasionally the results are strikingly good, but in younger patients I have had more pleasure in seeing the change I have brought about than in almost any other of my dental efforts.

A VALUABLE NEW DEVICE TO RELIEVE AN ABSCESS.

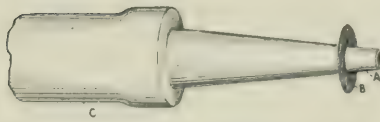
I submit to the Academy a device which has been of considerable use to me for some three years, and one that wins the immediate gratitude of the patient. It started by my slipping the end of the rubber tube of my saliva ejector over the cavity of a tooth, which had begun to ulcerate, and where I had opened into the pulp-chamber. The tooth was aching fiercely. Probably in a few hours it would have been all right, but I put on my rubber tube, started the ejector, and in two minutes the pain was gone. Since then I have used it frequently to relieve pressure, and also to get pus from a blind abscess. I use a heavy tube, as the ordinary one flattens by

FIG. 1.



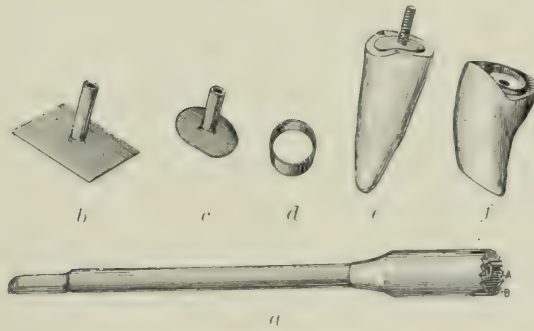
Tooth-brush. A, badger-hair; B, bristle.

FIG. 2.



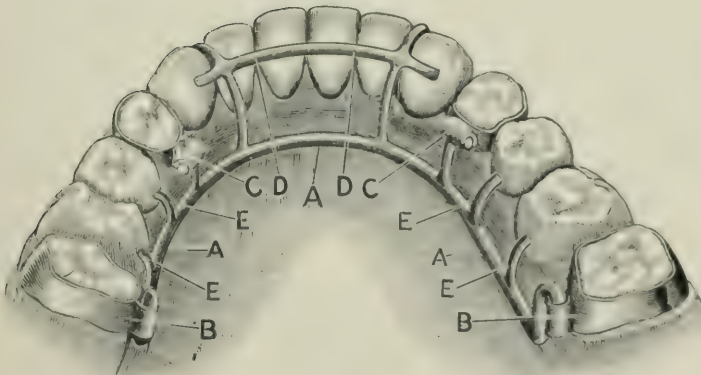
Abscess ejector.

FIG. 3.



Improved crown.

FIG. 4.



New retaining appliance. A, A, A, the half-round gold wire running around and resting on the gum from molar to molar: B, B, platinized gold wire soldered to half-round gold wire looping over and fitting into tube which is soldered on to band on twelfth-year molar: C, C, slotted tube on first bicuspids, also wire running from half-round gold wire to slotted tube in form of a T and fitting the same.

the suction. An ordinary rubber tube, hard by age, will do if not too rotten.

The tips which I have made to facilitate the suction are metal tubes sliding into the end of the rubber tube, and having a concave disk (B, Fig. 2) soldered a quarter of an inch from the end. This disk is filled with soft gutta-percha filling, heated and forced into the cavity, making a tight joint.

I show this attached to a bicycle pump, which can be used for an exhaust pump by reversing the valve. This can be used where the saliva ejector has not power enough. I have also used this exhaust in cases where I wished to draw a small quantity of blood and a leech was not at hand. A cut with the trephine lance, the rubber tube applied to the gum, and a quantity of blood is taken. The end of the tube should be small for this, as a large one is painful.

AN IMPROVED CROWN.

The painful trimming of the root, fitting, and subsequent recession of the gums in a Richmond crown have condemned it for my use. The weakening of the root by the large pin, and the large quantity of cement necessary in the Logan crown, likewise forbids its use, where the best is desired, and my experience is that some modification of the Bonwill crown is more satisfactory than any other to dentist and patient.

I much prefer setting the pin in the root first, rather than in the crown. The defect in the Bonwill, if used with the How screw-post, which is by far the best pin, is that on the stress the pin often breaks and the part left in the root is difficult of removal. I have, to remedy this, made and used a crown having a platinum ring attached to the crown and fitting into a circular slot around the root-pin. This prevents the root splitting or the pin breaking, and is quickly made, everywhere fitting the root accurately, even if done by a novice.

The first step is to shape the root saddle-shape, conforming to the gum line. Next set a pin in the root and bend it in the proper direction. Next cut the circular slot, by means of the trephine shown at *a*, Fig. 3. This differs from other trephines, in that it has a centring tube, *A*, which slides over the root-pin when in use.

Next put the platinum ring *d* into the slot and trim it flush with the root surface. Then take one of the blanks made of thin platinum, shown at *b* and *c*, burnish to root surface, and shape

to come exactly to the circumference of the root, as shown at *e*, and cut the tube off even with the pin. Put a little sticky wax on the under side, heat it, press in place, and cool. The band then comes off attached to the blank. Invest in some quick-hardening investment and solder with pure gold. Return to the tooth, take an impression over it, and finish by the model, which consists in fitting roughly a cross-pin tooth, bending the pins to nip the tube, so as to hold while the body is packed to the shape required and baked. The finished crown ready for cementing is shown at *f*, Fig. 3.

A CASE OF SWALLOWING A TOOTH.¹

BY G. N. P. MEAD, M.D., WINCHESTER, MASS.

THE following short history demonstrates the importance of teeth in our physiological economy, quite as much when they are where they should *not* be as when they are where they belong.

Teeth are found in dermoid cysts in the abdomen, they are taken from the œsophagus and stomach by surgeons, and they are normally found in the stomachs of some of the lower orders of animals, as the lobster; but the tooth whose partial history this paper relates was six years in the lung of the patient.

In the physiological lecture-room there used to be told a story by the lecturer—perhaps to test the credulity of his hearers—of an insane man in an institution who was being fed by a soft rubber tube passed through the nose into the stomach, through which soup was poured. One day the tube was passed—let it be hoped by mistake—through the larynx into the trachea and the pint of soup poured into the lungs.

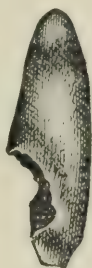
The soup was absorbed and no harm came to the patient. Perhaps if such a custom were persisted in, and coarser food than soup were introduced, nature might evolve teeth in the lungs.

This tooth, however, did not grow in the lung. The patient, Mrs. M. J. R., had had two sisters die of consumption, one at twelve years of age and one at seventy-six years. Her husband died at seventy-nine of heart disease. She had had typhoid fever twice,

¹ Read before the American Academy of Dental Science, March 6, 1901.

with a good recovery each time. In May, 1892, she had three teeth of the lower jaw extracted while unconscious from nitrous oxide gas. When she recovered from the gas the dentist was saying, "Hold your head over the bowl, or you will draw blood into your wind-pipe." She coughed and strangled violently at intervals for two days, when she had a chill, followed by pneumonia and pleurisy of the left side. The pneumonia was protracted for several weeks. She was in bed ten weeks before being able to sit up. It was a year before she could sit up all day. She slowly gained strength enough to drive and to do minor household duties. She was always short of breath, and had copious excretion of a mucopurulent character often stained with blood.

She was seen by me first in September, 1897, five years after the tooth-pulling. She had soreness in the left chest, and was especially weak. The secretion from the lungs amounted to two



Tooth drawn into left bronchus in 1892. Expelled by coughing in 1898.

coffee-cupfuls in twenty-four hours. The character of the secretion was serous, bloody, and slightly purulent. It was raised easily except when she was tired or the lung became more congested than usual.

The appetite and digestion were poor, but she slept well. The respiration was rapid,—thirty to the minute. The pulse was seventy-eight and the temperature normal. A diagnosis of bronchorrhœa was made, but the exciting cause was unknown. The examination of the secretion was negative so far as the bacilli of tuberculosis were concerned. The examination of the chest by inspection showed the left scapula moving somewhat more than the right; percussion showed some dulness at the base of the left lung; and the stethoscope revealed coarse moist râles in the left lung, most marked at the angle of the scapula. There were fine moist râles in the right lung.

She was seen at varying intervals in order to watch the tem-

perature, which proved to be normal, or nearly so, morning and afternoon.

In May, 1898, she had general aches and pains and chilly sensations, with considerable increase in the cough, more difficulty in expectoration, and a temperature varying from 100° to 102° F. She went to bed, and while lying in a horizontal position one morning a week after the beginning of her illness strangled. When the convulsion of coughing was over she found the tooth in her mouth.

Six years the lung had been trying to expel the intruder. The patient quickly rallied from the grip attack, but the pulse was weak and thready in contrast to the strong, full quality which had always characterized it.

The expectoration diminished to one-eighth the quantity, and the blood disappeared. The right lung cleared and the respiration was less rapid, varying from twenty to twenty-eight a minute.

During the summer she was driven about a few times. Her pulse remained weak and grew intermittent and rapid, varying in rate from 100 to 110.

In September, 1899, she had a mild attack of grip, the poison of which her heart was not able to bear, and she died in November from an enlarged and weak heart.

When the irritating stimulus of the tooth was removed the heart seemed to have reached its maximum of compensatory hypertrophy, and dilatation began. This dilatation was no doubt hastened by the attack of grip, her weight, which was about one hundred and eighty pounds, and her age, which was seventy-five.

The literature of the Boston Medical Library was thoroughly searched, and only sixteen cases besides the one reported were found of teeth drawn into the trachea below the larynx; of these, seven were fatal and eight recovered, either by coughing the tooth through the larynx or through an opening made by the surgeon in the trachea below the larynx. The longest time teeth have remained in the lung is thirteen years. The case was reported by W. G. Carpenter, in Guy's Hospital Reports, London, 1842. The patient died of pleurisy, and a piece of plate with four artificial teeth was found in the right pleural cavity, having ulcerated there from the left bronchus.

The longest time teeth have remained in the lung with the recovery of the tooth and patient, except the case reported to-night, is six months. This case was reported by G. A. Himmelsbach in

the *Buffalo Medical Journal* for August, 1897. The tooth was a molar coughed spontaneously through the vocal slit.

Therefore this tooth has remained in the lung longer than any case reported in literature in which the patient survived the recovery of the tooth.

Reviews of Dental Literature.

CHLORETONE AS AN HYPNOTIC AND LOCAL ANÆSTHETIC.—*Medicine* for August, 1900, contains an article by Ward upon this important and useful new drug. As he well says at the beginning of his article, hypnotics at best are only palliative, and are useful chiefly to tide patients over a critical period until they can be put into a condition to obtain a natural and normal amount of sleep. They perform a useful office by aiding us to put patients in a physical condition in which they will need no such artificial aid. An ideal hypnotic would be one which would produce sleep without disturbance of the digestion, circulation, or other unpleasant sequelæ. We have hypnotics which come very close to meeting these conditions, but there are none of them which are harmless if they are used for a long time and in quite large doses. One can but condemn the freedom with which the laity purchase the so-called harmless hypnotics. Ward has known of at least two deaths from twenty-grain doses of phenacetine taken upon the patient's own responsibility. Drugs of this character can be purchased as freely as coffee, and he has no doubt that if the experience of the profession could be recorded it would furnish an appalling array of disasters due to the enormous consumption of sulphonal and trional by the laity, without professional advice.

Ward has personally experimented upon himself with a number of the later hypnotics to observe their effects. Among these, chloretone was found to be the most efficient and the freest from bad after-effects. Next to chloretone, trional is one of the best hypnotics. Sulphonal may often be administered with excellent effect, but the bad results which sometimes follow its administration make one fearful in its use. Upon himself, trional caused a slight dizziness, which was noticeable the following day. In patients this was noticed only occasionally. After taking chloretone

for several nights in succession he noticed in the early morning a slight headache, which disappeared after taking a cup of coffee. He is not sure that this headache should be attributed to the drug, but not having been subject to it, it may be fairly charged to the chloretone.

After employing chloretone upon himself, Ward gave it freely to quite a large number of cases in which sleep was indicated. None of the patients knew what they were taking. One of the most brilliant results was in the case of a woman eighty-four years old, who, as a result of domestic bereavement, was unable to sleep more than one or two hours at night. This is but one of many such cases, and in only two patients has there been complaint of the slight headache on awakening in the morning.

Chloretone is a product of the decomposition of equal parts of chloroform and acetone in the presence of caustic potash. For a more exhaustive description of the chemical composition and physiological action, the reader is referred to the article by W. H. Porter in the *Post-Graduate* for May, 1900. Water dissolves one per cent. at body temperature. It is not very soluble in gastric juice, but five grains are immediately dissolved by one drachm of alcohol. The best method of administration is to give from three to five grains dissolved in alcohol or whiskey, and follow with a glass of milk at bedtime.

Hypnotics generally have been attracting unusual attention of late, in connection with the treatment of various diseases. The neuron theory of the production of sleep, as developed by Dercum and others, is of especial interest in this connection. It is too much to say that this theory has been proved, but it furnishes an admirable explanation of certain phenomena, and appeals strongly to scientific common sense. It may be said to stand in the same position at the present time to neurology that La Place's nebular hypothesis stood in its earliest days to astronomy, and that Franklin's theories in the kite-flying experiments stood to electricity. The primary features of the neuron theory regard consciousness as having its seat in the cortex of the brain. A theory of sleep based upon this conception regards both the nerve-cells and the dendrites as movable to a limited degree. Consciousness being the sum total of concepts due to the activity of these structures, it follows that as dendrites retract there is a lessening of such concepts with a consequent narrowing of the field of consciousness, until it

passes into normal sleep. If this theory of sleep is correct, it follows that drugs such as we are considering have their action explained by their effect upon the dendrites of the cortical cells. The superior dendrites are said by Leach to be depressed by the alcohol radicals of the ethyl and methyl type, while the inferior filaments most readily respond to the depressing effects of chlorine. The hypnotic agent which theoretically should have the best effect is one that would combine chlorine and methyl alcohol and at the same time have in its composition a minimum of other agents which may exert an unfavorable effect. In chloretone we have an hypnotic agent which seems to present these ideal theoretical advantages. It has been tested for some years at the Johns Hopkins Hospital, and bids fair to come into general use as an ideal hypnotic.

Chloretone has served a useful purpose in a number of cases of excessive hyperacidity of nervous origin. There are a class of cases which seriously tax the resources of the physician, and in a number of such cases Ward has given chloral hydrate and belladonna with marked relief. This led to his employing chloretone, as it is a local anæsthetic of some value. It was given in the form of a powder in three- to five-grain capsules on going to bed. It was found to be especially useful in those intractable cases of pain in the epigastrium which come on at night, interrupt sleep, and sometimes cause the patient to walk the floor, and to take large doses of bicarbonate of soda. The drug was used empirically, and its beneficial effect is undoubtedly to be attributed to its local anæsthetic action upon the gastric mucous membrane.

Chloretone would seem to be an ideal remedy in acute alcoholism, as we would not only obtain its hypnotic effect, but also its sedative action upon an irritable gastric mucous membrane. In such cases chloretone should be given in ten-grain doses dissolved in a half-ounce of whiskey or brandy, this to be followed in a quarter of an hour with a raw egg beaten in a glass of milk. This should be repeated each two hours until the patient is asleep.

Ward has used chloretone in one case of whooping-cough with marked benefit. A child four years of age was given five grains of chloretone dissolved in a teaspoonful of brandy; one-half of this dose was given at the beginning of the attack of coughing at night, and repeated if necessary. The first dose relieved the paroxysm and was followed by a quiet night's rest.—*The Therapeutic Gazette*.

CAPPING THE PULP.—Dr. Mendel Joseph, chief of the histological laboratory of l'École dentaire de Paris, in a paper read March 6 before the Odontological Society of Paris, deplors the frequency with which practitioners devitalize the pulp. He calls attention to the remote ills that may in certain cases be attributed to devitalized teeth. He divides cases of caries involving the pulp, suitable for capping, into those (1) where there is a thin layer of dentine protecting the pulp, (2) where the pulp is laid bare by the operator, and (3) where the pulp is exposed by the progress of decay without symptoms of inflammation.

“The sterilization of the dentine in the immediate neighborhood of the pulp calls for great precaution. Antiseptics used must be neither irritant nor caustic to the pulp. Its normal functions already disturbed by the progress of decay, by the presence of bacteria, and the chemical changes to which they give rise, the pulp will not endure a new irritation. Our efforts should be to bring it back to a normal state, to quiet its sensitiveness. How, indeed, can one expect so delicate an organ to exist for a long time in the presence of the repeated or permanent irritation that it is often sought to obtain in order to favor the formation of secondary dentine? One should not forget that this formation partakes of the nature of a pathological process, and should be kept, if possible, within safe limits.

“It is to ill-considered efforts made to produce a reaction of the pulp that one must lay the blame for all the forms of degeneration of the pulp, especially the calcic form, with the formation of pulp-stones,—one of the principal causes of failure, in my opinion, in capping pulps.

“In the presence of an organ so delicate the part of the antiseptic should be to modify rather than destroy the bacteria. A substance that will kill the microbe will be apt to kill the pulp as well. To make slow progress is to make sure progress. The dressing should be renewed several times. The object of the first dressing is to modify the medium in which the bacteria are multiplying, the second to arrest their development, the third and fourth to render them utterly inert.

“My personal observations in the capping of pulps in the manner about to be described goes back eighteen months, at which time I hit upon a filling-material that was admirably adapted to make the proceeding easy and successful,—plaster of Paris. For the perfect

sealing of an antiseptic dressing of a liquid or semi-liquid nature nothing can equal it; gutta-percha does not adhere to surfaces that are wet, and its insertion at such times is by no means easy, and, when it becomes necessary to change the dressing, can be removed only with the greatest difficulty. In short, it is owing to this material that I find myself able to make a successful modification of the treatment of exposed or inflamed pulps.

“My observations have led me to the conclusion that failure in pulp-capping is due to too great irritation from the dressings used, insufficient sterilization, or too much pressure on the pulp. In capping a pulp, one ordinarily excavates carefully, leaving, if possible, a layer of dentine over the pulp. He washes out the cavity with an antiseptic, applies an antiseptic dressing, and covers with cement. If there is an actual exposure, it is better to put the dressing in a little metal cap in order to avoid pressure on the pulp; this cap, by the way, is very apt to stay anywhere but upon the pulp.

“What is the ultimate result from this treatment? The infected dentine that has been left, for fear of uncovering the pulp too freely, is not made sterile by the one dressing, and as a result the micro-organisms continue to multiply, and inflammation and death of the pulp ensue.

“It is desirable, then, to succeed in completely sterilizing the cavity and to guard against any pressure on the pulp.”

His method, in as few words as possible, is this: The cavity is excavated, washed, and dried as carefully as possible, and a pledget of cotton wet with chloroform placed therein while the dressing is being mixed. The dressing is made as follows:

Zinci oxidi, gr. ii ;
Cocainæ hydrochlorati, gr. i ;
Guaiacol, q. s. to make a creamy paste.

With this paste are incorporated some fibres of asbestos to give it a little body. The paste is put into the floor of the cavity, after removing the cotton and chloroform, without pressure, is covered with a disk of asbestos paper, and sealed with plaster of Paris. This dressing must be changed at the end of twenty-four hours. In the second dressing two grains of salol take the place of the cocaine. This dressing is left sealed, as before, with plaster of Paris, forty-eight hours; it is then replaced by a third of the

same composition, which is allowed to remain four or five days, at the end of which time the final dressing of a paste of guaiacol and oxide of zinc alone, mixed as thick as possible, with the asbestos incorporated, is inserted and covered with the plaster. When the plaster has set it is covered with whatever one desires; if with gold, a layer of cement should be put over the plaster of Paris before the gold is inserted.

Dr. Joseph has treated ninety cases in this way, some of which gave evidence of more or less hyperæmia, without, thus far, any failures.—BRIGGS.

CARBONIC ACID IN DENTAL PRACTICE.¹—In this paper carbonic acid gas is considered as a means for the removal of sensibility from dentine. The two theories as to the cause of sensitiveness in dentine are first fully stated. One theory assumes the existence of nerve-fibres in the contents of the dentinal tubules, and the other theory holds that nerve-fibres reach no farther than to the region between the odontoblastic cells of the pulp, and that they are here acted upon in some way by the dentinal fibres. The author does not claim to settle the disputed point as to the reason why dentine is sensitive, but proceeds to a statement of the uses of carbon dioxide in general medicine. These he states to be to produce relief from pain in carcinoma of the breast and uterus, and other tumors, and in neuralgia of the uterus, the effect lasting from one-half to one hour. Carbon dioxide is also used as a disinfectant in bad-smelling discharges from wound surfaces, in catarrh of the vagina, in chronic skin diseases, ozæna, rheumatic affections, and other illnesses. In regard to the disinfection power of carbon dioxide exact investigations have been made by Kolbe.

In regard to the use of carbon dioxide in dentistry, the author says that he has given much time to the construction of an apparatus which makes it possible to apply the gas to dentine for the purpose of removing its sensibility.

His apparatus, which is made by Louis H. Loewenstein, Berlin, consists of three parts,—1. A carbon dioxide bottle filled with compressed gas. To it are added a reduction-valve and steam-gauge.

¹ Die Kohlensäure in der Zahnheilkunde, von Zahnarzt Max Bauchwitz, Stettin. Deutsche Monatsschrift für Zahnheilkunde, März, 1901.

2. A warming apparatus. 3. A small mixing-tube, by means of which carbon dioxide can be mixed with a medicament.

By this apparatus the gas goes from the storage bottle at a pressure of not over one-half atmosphere and enters the heating device, and is then discharged upon the tooth at the body temperature. The anæsthetic effect can be increased by the addition of a twenty per cent. cocaine solution. This solution is mixed with the carbon dioxide in the mixing-tube. The author's rule is to use first the pure gas, then the medicated gas, and finally pure gas, and anæsthesia is claimed in from two to three minutes.

It is interesting to note how the author explains the action of the carbonic acid gas in view of the two theories first stated in regard to the cause of the sensitiveness of dentine. Provided the dentinal fibrils contain no nerve-filaments, then the carbonic dioxide acts by impregnating the protoplasm of the dentine, and by its presence paralyzing it so that it conveys no impressions to the nerves of the pulp. If we allow that the dentinal fibrils contain nerve-fibres, then the carbon dioxide acts directly upon them.

A further use of a warm stream of carbonic gas is stated to be for the drying and disinfection of root-canals. The author mentions its use in the extraction of teeth and small surgical operations in the mouth as a proper field for investigation.

When we consider what results can be accomplished in the removal of sensitiveness from dentine by the use of warm air alone, it would seem that special pains should be taken with the apparatus just described, to be sure that the results attained were really dependent on the peculiar action of carbonic acid gas, and could not have been produced by the drying effect of a current of warm air. The author brings out very clearly, however, the physiological proposition that carbon dioxide exerts a paralyzing effect upon protoplasm, and thus offers a plausible explanation of its action on the contents of the dentinal tubules.—WILLIAM H. POTTER.

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held at the office of Dr. E. S. Robinson, No. 28 West Thirty-ninth Street, New York, on March 5, 1901, the President, Dr. J. Morgan Howe, in the chair.

The minutes of the last meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Hypertrophy of Upper and Lower Jaws.

Dr. S. E. Davenport.—Dr. Kasson C. Gibson regrets his inability to be present this evening, and has very kindly sent for our examination a model representing a case of extreme hypertrophy of both upper and lower jaws, more particularly of the gum tissue. The patient is a man twenty-nine years of age and in general good health in other respects. He was referred to Dr. Gibson by Dr. Bull, the surgeon. The patient has, I understand, recently been operated upon and the hypertrophied tissue removed. Dr. Gibson has been kind enough to promise that when he has an opportunity he will take a model of the mouth representing the condition after the operation, which he will present to the society.

Inlay Work.

Dr. C. F. Allan.—I do not know that there is anything new I can present regarding the subject in which I am so much interested, inlay work, but I have thought that possibly in overcoming some of the difficulties which I have met, especially in approximal work, I may have gained experience which will be of use to other dentists.

In making matrices probably more difficulties are to be encountered than with any other part of the work. Where the cavities are not on approximal surfaces I have been in the habit of putting my piece of No. 30 gold, of which my matrix is to be made, on a sheet of spunk, and then with an apple-seed burnisher pressing the gold into the spunk, to in some measure approximate the size and shape of the cavity; then, when the gold is placed in the cavity and

pressed in carefully with spunk, a clean matrix will generally be made without any break in the gold. Most frequently, however, in approximal cavities with teeth close together this procedure is impossible, and with cavities moderately deep it is often impossible to get a matrix that is not seriously broken at the bottom of the cavity, sometimes, indeed, with the bottom broken almost entirely away but with all the margins perfect. In such cases I find that by using the smallest scrap of No. 3 foil, a scrap not much larger than the bottom of the matrix, putting it on the investment and then placing the broken matrix over this scrap of gold, by the gentle tapping necessary to settle the matrix I have a bottom and a perfect mould. Another difficulty is in cutting the little notches in the sides of the inlay. The smaller inlays are very difficult to handle with the fingers, and with the extremest care the operator is in constant danger of losing them. If one will, however, keep in his cabinet half a dozen or so orange-wood sticks tipped with shellac, all he has to do is to hold the point of one of them over his Bunsen burner and it is but a matter of a few seconds when he has his inlay held in a practical way that admits of no losing and makes easy this otherwise troublesome detail. Another difficulty with me was in connection with the investment. Asbestos powder moistened either with alcohol or water allows the matrix to drag, and this unsettled and easily moved condition of the matrix was very annoying, but by using fyrite, a new investment material sold by the S. S. White Company, this difficulty was overcome. The matrix holds solidly in it and it makes a perfect investment material for the low-fusing bodies where gold is used for the matrix, but it should not be used for the high-fusing bodies. Possibly it may need a little more careful drying, taking a minute or more time, but otherwise it is all right.

The President.—We have present with us this evening Dr. Eugene Smith, of Boston, and Dr. Brackett, of Newport, also Dr. Fillebrown, Dr. William P. Cook, Dr. Taylor, and Dr. Bradley. We are especially favored in having all these gentlemen present with us, and we hope to hear from all of them before the evening is over.

I have the pleasure, gentlemen, of presenting to you Dr. George A. Maxfield, of Holyoke, who will read a paper on "Malignant Growths in the Mouth, Incidental to General Practice."

(For Dr. Maxfield's paper, see page 373.)

DISCUSSION.

The President.—In the discussion of this interesting paper we are to have the pleasure of listening to Drs. Dawbarn and Coley, after which we hope to have the pleasure of listening to others present who may wish to join in the discussion. Dr. Dawbarn, gentlemen.

Dr. R. H. M. Dawbarn.—Mr. President and gentlemen, the chairman of the Executive Committee has twice done me the honor to ask me to be very full in the discussion of this paper. If I were to take him at his word I am afraid that the discussion would occupy all of this evening and some of to-morrow. It will only be possible for me to touch here and there. I would rather leave intervals which, if questions are asked afterwards, I may be permitted to then fill in. I will discuss the subject of diagnosis and treatment in the following order, taking up the malignant conditions of the soft parts first, afterwards those of the hard parts. In the interesting paper that has been presented to us this evening the morbid condition known as “leucoplakia” has been mentioned. As the name implies, it is of a whitish appearance, sometimes called “wash-leather,” and may involve any surface within the mouth,—lingualis, buccalis, or gingivalis. This wash-leather appearance, in about twenty-five per cent. of cases, is the precursor of epithelioma. This disease occurs very much more frequently in those addicted to excessive smoking. Avoid everything irritating in treating it, such as the use of nitrate of silver or any other caustic. Stop smoking. Use only soothing mouth-washes. None but radical operations should be performed for its cure; and whether to operate will depend upon the differing conditions in each case. As to cancer of the tongue:

Diagnosis.—To be distinguished chiefly from syphilis of the tongue. There are quite a number of distinguishing features,—viz., cancer of the tongue (epithelioma) is almost the only type of malignant growth of the tongue; it begins almost always from a decayed tooth as an irritant factor. Although not the actual cause of cancer, mechanical irritation is generally the predisposing cause. This is again shown in cancer of the scrotum as found in chimney-sweeps. Indications of syphilis are more frequently on the dorsum of the tongue; cancer, as stated, begins at the point of tooth irritation. Cancer generally presents a single ulcer, while syphilis is

often seen in more than one place on the tongue. Cancer is the more painful of the two; it occurs in patients a great deal older, over forty years, as a rule, while syphilis occurs more frequently under that age. Cancer is oftener found in the male, syphilis more frequently in the female. The discharge is more offensive in cancer. In cancer it is only the neighboring lymphatic glands beneath the lower jaw that are involved, while in syphilis the enlarged lymph-nodes are more diffused, occurring elsewhere in the body quite as much as near at hand. But after all, the diagnosis upon which we are chiefly to rely is what is revealed to us by the microscope. In the case of a cancer, upon removing a small piece you will find nests of epithelial cells surrounded by a stroma. In the case of syphilis we find small round-celled infiltration. Indeed, syphilis has been called a "disease of the degraded leucocyte."

Another ulcer occasionally seen here is that of tubercular diseases. Although this ulcer may somewhat resemble the others, it is excessively rare for it to occur as a primary condition, and generally there is evidence of very advanced tuberculosis elsewhere. The microscope will reveal the tubercle bacilli, etc., in a section removed for examination. We can also have ulcers due to simple uncleanliness, of course, the microbes of the mouth, of which there are some twenty varieties in the human saliva, setting up an irritation in certain cases. Some of these microbes are pretty virulent. The microscope will also help us here. So much for differential diagnosis.

Treatment.—In carcinoma of the tongue I hardly need say that there is only one treatment, which is prompt and radical surgery. Every week, or certainly every month, I see cases in my hospital and elsewhere that have gone too far for hopeful results. Perhaps one reason for this is, that on account of the surgeon suggesting the removal of the whole of the tongue, the patient delays the operation until it is too late. Inasmuch as these growths generally occur at the extreme lateral margin of the tongue, the operation for the removal of one-half the tongue will be just as effective, in most instances, as the more radical operation of the removal of the entire tongue, and with half a tongue the patient can speak fairly well. In so far as blood-supply and lymphatics are concerned, we have practically two tongues. It is easily shown, by injecting one of the lingual arteries of a cadaver with blue solution, that one-half, exactly, of the tongue will be blue, and the other will remain

red, there being no anastomosis between the two halves except sometimes at the very tip.

There are a number of interesting points in connection with excision of the tongue, or part of it. As ordinarily done, in my estimation, three or four mistakes are made. I think the Whitehead operation should never be done. This operation is made entirely within the mouth. It is akin to performing an operation for cancer of the breast without cleaning out the armpit glands. The lymph-nodes (glands) beneath the jaw should always be removed, because they will frequently develop cancer later on, being really infected, though not to be felt at first. For this reason the tongue should be removed from beneath the jaw, as then the glands can at the same incision be attacked. In this incision there is the great advantage, too, that we can easily expose and tie the lingual artery before cutting the tongue, and thus the operation is rendered almost a bloodless one. If it is possible to do so, without approaching the cancer, I think it wise to save the last two or three centimetres of the tongue, instead of removing it entirely down to the hyoid bone; this to aid the epiglottis in its work. We should save the twelfth nerve, which is entirely a motor nerve, and which can readily be attached to the raw surface of the stump of the tongue, thus innervating it. This will enable the epiglottis the better to be brought down on the top of the larynx in swallowing. I think this is a new point and a good one; it is one I have employed. It is extremely important, where the tongue is removed far enough back to affect swallowing, that for a long time the patient be kept in an inverted position,—that is, with the head a little lower than the chest,—so that the rank and fetid saliva and discharges shall not gravitate into the larynx and so on towards the lungs. The patient after this operation is especially threatened with a septic pneumonia from this cause. He can be kept for weeks in this position if need be, and should not be allowed to sit up until the parts are well granulating and the saliva is quite odorless again, or, better, learned to close the epiglottis.

In those cases of cancer of the tongue which have gone beyond the reach of radical cure there are still certain things that may be done. I do not know of anything in surgery quite as near like magic in its dramatic results as the outcome of the division of the lingual nerve (the so-called gustatory nerve), where there is intense suffering in cancer of the tongue and where it has gone beyond

the use of the knife. The pain sometimes is so great as to bring tears to the patient's eyes at every act of deglutition or speech. The lingual nerve, which is the one causing the suffering, can be divided in five seconds' time under cocaine, by introducing into the mouth a curved bistoury two centimetres below and behind the grinding surface of the last molar tooth and cutting against the ramus of the jaw towards that tooth. There is nothing else of any importance that can be injured here, and the instant the section is made the patient cannot feel any pain in this half of the tongue, in front of the circumvallate papillæ. Of course, the nerve will grow together again in a shorter or longer time, but it can be as easily divided again.

Bony Malignant Growths.

Of these, the ones most frequently seen by dentists are those of epulis springing from the socket of a tooth. They may or may not be sarcomatous. In any case one should not hesitate long. Many tumors of the mouth and elsewhere, although benign in their incipency, will frequently develop malignant characteristics in time. If a fungous growth that has been curretted away returns, no attempt should be made to retard it by means of pressure, as by a gutta-percha plug, as has been done, nor with leucoplakia, should it be treated with irritants. It is a case for a surgeon; and the treatment should be either nothing or absolutely radical. It is best not only to curette away the growth, but a considerable portion of the alveolus in that region should be removed by the gouge. Early diagnosis of bony malignant growths about the jaw and elsewhere has brought out one point in my experience which I have repeatedly alluded to before in this connection. Every one knows that not infrequently both sarcoma and carcinoma decalcify bone, and that fact can be used in early diagnosis. Our honored president remembers a case which he referred to me in 1896, in which a dentist extracted one of the bicuspidis in the upper jaw for a severe face-ache. He noticed with casual interest that the tip of the root, which should have been of stony hardness, was soft. That ought to have been to him a striking evidence of a malignant growth. However, the dentist did not think of it, and subsequently the case came to Dr. Howe. He suspected a malignant condition, and sent the case to me. I have here a specimen, which some of you have seen, and which indicates the condition. (Upper jaw removed

from this patient was here shown with sarcoma filling the antrum.) I made the diagnosis by taking an ordinary sewing needle, and I found that I could pass this needle into the bony roof of the mouth with about the same resistance as in ordinary cartilage. In a good many instances this will be of help to you. If you can run the needle into the bone, or even engage the point in bony tissue, which should be dense, a malignant growth should be suspected.

Prognosis.—I starved the region by cutting out the external carotid on both sides. And this brings up a very interesting question of treatment. When one is able to excise a cancer and cut well beyond its limits, it is of course the wise thing to do. When this is impossible, and unless the antitoxin treatment succeeds (and the usefulness of the latter seems limited to one type of sarcoma alone), then the patient is going to die within a few months with absolute certainty. There is nothing more hopeless than cancer of the mouth or jaws which have got beyond the possibility of excision. There is but one hope left in these otherwise hopeless cases, and that is the starving of the growth by cutting off its blood-supply. By that I do not mean simply *tying* both of the external carotids, but cutting them out from end to end, tying off and dividing all the branches in the process. Ligating the internal or the common carotid would cut off the blood-supply from the brain. It is simply desired to cut off the blood-supply from the superficial parts.

It seems proved that the normal tissues can get along with very little blood as compared with that required by a malignant growth, and when the blood-supply is cut off from this growth, although it does not disappear, it shrinks, and in most instances does not resume its growth. In sarcoma I have been particularly successful, less so in carcinoma. I will say this, that I have seen many cases, otherwise utterly hopeless, which by this method have had many months of life. Although I would not promise a cure, I can at least promise this. The method consists in cutting off the blood-supply from the external carotids on both sides. As I have said, it consists in not merely tying these arteries, for if only that were done the pulse would return inside of a week so that it could be felt in the temporals and facials. There are thirty or forty ways in which by anastomosis this might happen. It first occurred to me six years ago, and I then tried it at once, that a more radical way might be carried out by cutting out the entire length of both

of the external carotid arteries. This sounds like a pretty dangerous operation, but it is not excessively difficult to do. It can be done inside of half an hour. I never attempt to do it on both sides at one operation, however. The only case I know of where this was attempted resulted in the death of the patient from shock, at the hands of another operator. I prefer to do it in two operations at intervals of two weeks. I have now done this operation in over forty instances. In several cases, after the operation on the affected side first, there was so much shrinkage of the growth that the patient, mistakenly thinking himself cured, refused to have it done on the other side. Now I always do it on the sound side first, and then the patient, finding there is no change, will consent to having it done on the other side. The operation has also been done by Dr. Keen and Dr. DaCosta, of Philadelphia, and in New York by Drs. Blake, Bremen, Weir, Lilienthal, W. Meyer, Collins, and others, with a very low rate of mortality. In every one of these instances the patient was cachectic, and from that fact one would expect a greater mortality. I would be willing to assert that in experienced hands the operation will not result in over five per cent. of deaths. The amount of blood lost need not exceed an ounce. You may ask how these parts can now get any blood-supply at all. There are two at least, one from the internal carotid, which by its infraorbital branch anastomoses with the angular from the facial; the other through the occipital branch of the external carotid; the princeps cervicis branch of this artery anastomosing with the profunda cervicis coming from the first intercostal artery. It is perfectly feasible to cut off still further the blood-supply by tying the infraorbital and occipital if desired. It has been suggested by Dr. Wyeth, in order to still further cut off the blood-supply from the smaller branches, that the internal maxillary artery, for example, be injected with boiling water. Another suggestion of Dr. Wyeth is the injection of sterilized paraffin, or some combination of wax which at the temperature of the body would again become solid.

It is a question, however, whether this would not seriously threaten sloughing of the part; and, of course, we would not try such means until after carefully experimenting upon the lower animals. We are justified, however, in taking radical measures when we remember that these are hopeless cases, directed straight to the other world in a very short time unless the disease is checked

by some means; and that medicines, and even ordinary surgical intervention, are wholly useless in the more advanced cases. Mr. President, I have already taken up more time than I meant to. I will therefore conclude, and if there are any questions, I shall be very glad to answer them to the best of my ability.

Dr. Wm. B. Coley.—The demonstration has already brought out most of the points that are of great interest. What I have to say will be based upon my own clinical experience in these cases of cancer of the jaw.

I have personally had twenty-five cases of cancer of the upper and lower jaw, eighteen of the upper and seven of the lower jaw. The patients ranged all the way from twenty-two to seventy-six years. The majority were comparatively elderly. Five cases were between sixty-five and seventy-six. Sarcoma was by far the most frequent. I have seen only one case of carcinoma of the upper and none of the lower jaw. The malignancy of these different growths varies very much. Growths in the lower jaw are more dangerous to life than those in the upper. I have some notes of cases of sarcoma of the lower jaw which I will mention.

1. Disease occurring in a woman aged forty-eight. Killed her in four months. The disease started, as most of these do, almost exactly as an inflammatory growth, apparently beginning in an alveolar abscess. There was a small amount of pus. Two or three different physicians saw her, and it was washed out by various solutions. The diagnosis was not made until the tumor had reached a large size. The question of pain is very important in distinguishing whether the trouble is sarcomatous or inflammatory. In the malignant growth the pain is seldom severe, while in the inflammatory process it is more marked. I doubt the wisdom of Dr. Maxfield's suggestion of using washes in these doubtful cases, thus losing several weeks of valuable time. In every doubtful case a small piece should be snipped out and submitted to a microscopical examination.

2. Woman thirty-nine years of age. Operated upon in Ohio ten years before. Operation done comparatively early. Half the lower jaw resected from the symphysis to the joint. Remained perfectly well for ten years, then there was an extensive local recurrence, as shown by the photograph. Treated her for several weeks with the mixed toxins but with no apparent benefit.

3. Another case of late recurrence of sarcoma of the lower jaw,

operated upon five and a half years prior to the recurrence. Entire half of the jaw removed. Did not recur in the glands nor in the jaw, but in the mastoid portion behind the ear. Treated with mixed toxins for two or three months. At first there was considerable diminution in size, but after a while the toxins seemed to lose control, and I was obliged to abandon it.

4. Sarcoma of the nasal fossa, afterwards invading the antrum. Treated with antitoxins, and it was one of the few in which there was any marked improvement. The case was operated upon by Dr. Bull in the New York Hospital. It was a round-celled sarcoma, and recurred promptly after the operation. Under the antitoxin treatment the tumor almost entirely disappeared, and he was sent out of the hospital. Very soon, however, it recurred, and although the toxin treatment was begun again, it seemed to have no effect. He went on rapidly from bad to worse; the growth became very vascular, and in a very bad cachectic condition he was operated upon by Dr. Dawbarn. I believe he is one of the few cases of death by this operation.

The early histories of a few of these cases show what some of the early symptoms are.

1. Sarcoma of the lower jaw; age, thirty-seven. The first she noticed was pain or discomfort in the region of a tooth that had been drawn some time before. History of an injury, having struck that side of the face against a door. This question of injury Dr. Dawbarn has already referred to. In nearly all of my jaw cases there was a history either of injury from wearing an ill-fitting plate or from pulling a tooth. Several patients have stated that the tooth was drawn with great difficulty, and in doing so a piece of the jaw was broken. This generally antedates the tumor some weeks or months. It is a very common history.

2. Case of very great interest; a young man of twenty-four; treated by Dr. Spencer, of Watertown, N. Y. Growth soon reappeared. It was a spindle-celled sarcoma. He declined to have a radical operation. He was treated with toxin for about a year, when the growth almost disappeared. The granulations which came out of the lower opening of the antrum became less and less vascular, and finally almost altogether ceased to appear. The tumor then began to grow and did not respond to larger doses of the toxins. Impossible to control it. The patient died within a year and a half of the beginning of the disease.

3. One more case of great malignancy, first seen October 2, six years ago. The first symptom was a small ulceration in the alveolar process of the lower jaw. The patient was forty-eight years of age. Within five weeks the whole mouth was filled up. The glands in the neck were enlarged. He could not swallow anything. Died within three and a half months of the beginning of the disease.

Dr. Dawbarn has already spoken rather fully regarding the diagnosis of these tumors. I would like again to emphasize the point of early diagnosis. Regarding the question of pain, the general popular idea is that all malignant growths are very painful, and unless the patient complains of a great deal of pain the physician or dentist is not impressed with the condition. It is these painless swellings in the jaw and elsewhere which are so dangerous. From the very fact that they are not painful at first, and are not recognized perhaps until they become painful, it may be too late. I think, especially in the jaw where these growths are unusually malignant, any abnormality in the way of a growth or a thickening of the parts should not be neglected, but a portion be removed under cocaine and examined microscopically at the earliest possible moment.

The prognosis in the lower jaw is absolutely bad. In nineteen cases collected by Butten none died of operation, twelve died within a year, only a single case lived as long as two and a half years, and not a single one of the nineteen passed the three-year limit. The upper jaw is not quite so bad. Ten or fifteen years ago it was very much worse than now. The latest statistics of Martens, which are the only ones carefully traced, show that out of eighty-four cases operated upon, seventy-four being complete resection of the upper jaw, sixteen lived beyond three years. Of these cases, five were epithelioma, three carcinoma, two round-celled sarcoma, one spindle-celled sarcoma, one endothelioma, and one giant-celled sarcoma.

Regarding the toxin, I do not recommend it except in cases of sarcomatous growths. Dr. Dawbarn's statement was not quite right when he said it was applicable only to one kind of sarcoma. I have found it to work better in the spindle-celled variety, but it is applicable to all kinds of sarcoma. I have treated four cases of round-celled sarcoma with success; that is, they have lived more than three years. One of these was sarcoma of the upper lip. She

was treated four years ago. It was certainly malignant. It has entirely disappeared, and the patient is in perfect health.

In a case of round-celled sarcoma of the mesentery, the patient has been well more than five years. In the spindle-celled, which is the most favorable variety for the antitoxin treatment, the prognosis is better. Of the cases which I have treated with this method, I have had fifteen which have remained well from three to eight and a half years. Up to 1898 there had been thirty-five successful cases treated by this method by other men, and ten of these were round-celled. When you consider that these cases were entirely hopeless, it must be admitted that something has been accomplished. I think it shows that the toxin has a place in the treatment of these diseases. Of course, it is a very great pity that it does not act as well on carcinoma and the various other forms of sarcoma as it does on spindle-celled. It seems to me that we have here a clue to the direction of the future treatment of malignant diseases. Supposing carcinoma and sarcoma to be due to some form of micro-parasite, we are not likely to get any great improvement in our present surgical results, and we cannot hope to successfully treat the disease until we know something of its cause. I think we shall know more about this in the next ten years. Large sums of money are being left every year to investigate this problem and some of the best minds in the profession are at work on it.

I thank you for the courteous invitation from the chairman of your Executive Committee, and have enjoyed being with you very much.

Dr. C. A. Brackett.—I would like to ask Dr. Coley for some explanation as to the nature of these toxins and how they are used.

Dr. Coley.—The first preparation used was a living culture of erysipelas. I started on this line in 1891, the result of an interesting case of sarcoma. It was the case of a patient who had been operated on four times by Dr. Bull. At the last operation he exposed the carotid artery, and, finding it impossible to remove the growth, he closed the wound and gave the patient up to die. The patient had an attack of accidental erysipelas, and two weeks afterwards a second severe attack. I found the patient alive and well seven years afterwards. This case led me to this line of investigation. The original preparation was a pure culture of the streptococcus of erysipelas. I used it in twelve cases, with two fatalities from erysipelas. In some cases I had great difficulty in pro-

ducing erysipelas. In one case, although I injected the living culture, I could not produce the disease, but I was able to control the malignant growth. This led me to discard the pure living culture and take up the toxin, which could be used with perfect safety. This can be sterilized with a little thymol and kept for several months. It is prepared by Messrs. Parke, Davis & Co. I find the toxins vary greatly, and have attributed my ill success in many cases to this fact.

Dr. Maxfield.—I would like to ask Dr. Dawbarn if there is any liability of diagnosing actinomycosis as carcinoma or sarcoma?

Dr. Dawbarn.—I do not consider the diagnosis ordinarily to be difficult. Actinomycosis is caused by a ray-fungus, which can be seen and recognized very readily by a very low magnifying-glass. Still, it is admitted that when there are very few actinomycetes present, and the disease does not cause suppuration, but merely a slowly developing growth, that chronic form of actinomycosis may extremely closely resemble sarcoma. It may be almost impossible to differentiate.

Dr. Brackett.—I cannot attend a meeting of the Institute of Stomatology without at least expressing my gratification at being permitted to come, and I certainly have the liveliest appreciation of the instructive material that has been placed before us this evening. As a dental practitioner I have been greatly impressed with this subject, and with the importance of the discrimination which is necessary in dealing with these cases. I think, on the one hand, that it is very greatly to be desired that the mind of the patient should not be unnecessarily alarmed. There have been numerous instances of extreme apprehension being aroused by the inconsiderate and not always intelligent expressions of the dental practitioner. On the other hand, I think the dentist should be sufficiently conversant with the ordinary indications of malignancy and of benignancy to guide the patient in the safe direction. I have also been much impressed with the doctrine, so well expressed by Dr. Garretson, that when a pathological growth in the mouth is not of a nature explainable as any of the common pathological conditions, such as inflammation, abscess, hypertrophy, ranula, etc., are explainable, then the growth is to be treated with the latitude due to cancer. Every dentist has the opportunity of allaying in patients' minds groundless apprehensions concerning new growths, and doing this is fulfilling a most beneficent mission. However,

whenever a growth appears at a time of life and under conditions which cause a suspicion of malignancy, that patient should at the earliest possible moment have the advantage of the best skill. All of us see these cases at times, and in all cases we should be alert to exercise our resources to set aside influences which may occasion malignant growths, or which may tend to change the character of growths which in their inception were benign. An operation, when it is undertaken, should be undertaken by a person of ability, and should be radical, reaching beyond the region of diseased tissue. One word with regard to the specimen presented, the diagnosis of which was made by sticking a needle into the bony structure. Such a growth may be impressively demonstrated by putting a small electric lamp in the mouth in a dark room. The difference of translucency of the two sides would be most marked.

Dr. Dawbarn.—Transillumination was used in this case. It is extremely essential in all cases of antrum trouble. The simple test of the needle, however, is also very useful in this connection.

Dr. T. Fillebrown.—Mr. President, I have experienced great pleasure in listening to the paper and the discussion. I shall attempt to add but little. The remark was made that pressure is useless in these cases. My experience indicates that it may sometimes be effective. I had a case of epulis which occurred between the lower bicuspids. The patient was a lady forty years of age, of an extremely nervous type. I think she would have died rather than have submitted to the knife. She would not think of any violence being done whatsoever. I took some cotton and, placing on it some strong persulphate of iron, pressed it in between the teeth. At the next visit the growth was very much shrunk away. I continued to do this, and within the course of two weeks it was completely cured and never returned again. Usually I would have used the knife or engine and gouged the growth away. Most patients would submit to it. If I had another patient of this same temperament I should resort to the same means. In another case of a lady over seventy years of age there appeared a cancer between the median line and the third molar tooth. It was decided to remove the growth, which I did, making a hole in the roof of the mouth three-fourths of an inch in diameter. I lengthened out her artificial plate to cover it. That was nearly three years ago, and the place has remained entirely well; indeed, it has almost filled with granulations. Bunches have, however, appeared around the

tuberosity of the same side, so that her plate has of necessity been gradually cut away. As she is over seventy years of age, she will probably not submit to another operation. I would like to ask Dr. Coley if the toxins have ever been used to prevent a return of the disease.

Dr. Coley.—I have never used the toxins in primary operable growths, only in inoperable cases. I believe the toxins will be found to be very valuable, used as prophylactic after primary operations without waiting for recurrences. I would deprecate small operations. The operation should be radical or not at all.

Dr. L. C. Leroy.—There are two questions which I would like to ask in this connection, Is the disease infectious, and is there an hereditary tendency towards cancer?

Dr. Dawbarn.—I think that in cancer, as in tuberculosis, although it is not directly inherited, there may be occasionally an inherited tendency, a kind of soil in which certain seeds readily take root. One famous instance is that of the great Napoleon, who died, while still a young man, of carcinoma of the stomach. Five members of his immediate family died, I believe, of the same disease. Regarding the disease being infectious, though autoinfection is not excessively rare, there is not one well-authenticated instance where either carcinoma or sarcoma has been transmitted from the patient to the operating surgeon, although many times he has cut himself during the operation.

I would like to say in this connection that, while I have the utmost respect for Dr. Fillebrown's experience, still I do not think it would be the wise thing in a case that you believe to be sarcomatous epulis, or cancer, or any other malignant growth, to temporize with it, or to apply a caustic, hoping in this way to get rid of it. There is no doubt in my mind that in this particular case it was not true sarcoma, for had it been it would most certainly have returned, and it might then be too late to operate successfully for its thorough removal. Dr. Fillebrown presents no proof that this case of his was of a malignant nature; no pathologist examined a piece of it, which is the only true test; and hence it should not be alluded to as a cancer or a sarcoma.

Dr. Coley.—I have seen two or three instances myself, and have known other surgeons who have seen cases of the infectious nature of these malignant growths, at least as regards the individual. In case of sarcoma of the mesentary, for instance, after an

exploratory laparotomy there was complete infection of the normal abdominal wall following the operation. A similar case of all the clean-cut surface being infected in opening up a tumor of the neck. This is one of the reasons why I prefer the Whitehead operation for cancer of the tongue.

Dr. E. H. Babcock.—I would like to speak of a couple of cases which I have had within the last few years, probably of epulis. One was the case of a child ten or twelve years of age in whom I observed quite a large swelling on the lower left-hand side in the molar region. This was six years ago. After scooping it out with a spoon excavator, I touched the site with chromic acid, and it has not returned.

Last fall a lady patient called, who said she had a great secret to impart to me. I examined her mouth and found on the left side, in the site of the bicusps, a purplish swelling about the size of a hickory-nut. The upper surface was somewhat eroded but it was not pedunculated. She wanted me to handle the case, but I did not do so. I told her it would be well for her to see a surgeon at once. She went away, and I have heard nothing from her since. I felt that it was hardly wise for me to take any specimens from the growth, for fear of causing irritation and thus hastening its growth.

Dr. Andrew J. Flanagan.—It seems to me that the very essence of this evening's discussion was found in what Dr. Dawbarn said regarding the practitioner of dentistry having a scientific knowledge of these conditions, and I think it behooves us to prepare ourselves in this direction. At the present time it is a rare thing not to find a specialist in pathology and bacteriology in any given locality, and such being the case it is not difficult to obtain sure and scientific means to a correct diagnosis and prognosis. With the present knowledge of such cases reported here this evening, would we not be criminally negligent if we did otherwise? Dr. Brackett has referred to our beloved friend Dr. Garretson. Having been a student of his for several years, the necessity of finding the cause of a disease was well impressed on my mind. His philosophical mind well taught one thing,—never try to remove the cause until you have found it. If we do otherwise in cases such as presented here in the paper and discussion, are we not guilty of modern empiricism?

Dr. Maxfield.—Dr. Brackett's remarks about saying anything that will unnecessarily alarm the patient puts me in mind of the

case which was ultimately sent to Dr. Coley. The patient's wife came with him each time he came to the office. At one of the later visits a dentist of my acquaintance was with me in my office. I had been speaking to him about the case, and that I thought it was a malignant tumor. At this visit, after seating the patient in the chair I called my friend, who examined the mouth and, turning to me, said, "I think as you do." I then stepped out to the patient's wife and told her the case was too serious for me to treat any longer, that it would be necessary for him to go to Boston. At that she asked me if I thought it was cancer, and began to cry. I reassured her as best I could, and endeavored to impress her with the necessity of keeping up a brave heart before her husband, and not to let him mistrust we thought it was a malignant growth. Just then I heard this gentleman say to the patient in the chair, "Yes, I think it is cancer you have got. It looks to me like a cancerous growth." That night I found the patient completely demoralized and threatening to commit suicide.

Dr. Geo. L. Parmele.—I wish to thank the Institute for an interesting and instructive evening. I remarked facetiously to Dr. Maxfield when I met him that I did not care for his paper, as I had already heard him talk along those lines all the way from Springfield to Boston, but I was anxious to hear all Dr. Dawbarn had to say, for I never listened to him that I did not gain valuable points. I was about to remark that I never attended but one of these meetings without getting something of value from them, and that was when I read a paper before you about one of my fads, but I remember even then I gathered some valuable information concerning my hobby in the discussion which followed my paper.

Dr. Davenport.—While there is really no difference in the obligation which we are placed under by the words and instruction of the three gentlemen who have entertained us to-night, we should perhaps make this distinction. Professor Dawbarn and Dr. Maxfield are our members, and we expect their brightest thoughts to be brought here. To Dr. Coley we are under especial obligations. I move you, sir, that the thanks of the Institute be extended to these three gentlemen who have entertained us to-night. Seconded and carried.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Boston, on Wednesday evening, March 6, 1901, at six o'clock, President V. C. Pond in the chair.

The minutes of the previous meeting were read and approved.

Previous to the dinner Dr. Meriam, in answer to several inquiries by Fellows of the Academy regarding the condition of the membrane where extension crowns had been inserted, presented a patient showing the case as reported before the Academy October 5, 1898, and published in the *INTERNATIONAL DENTAL JOURNAL*, March, 1899. The crowns had been in position over eight years, and the healthy condition of the membrane and of the teeth adjoining them, together with their cleanliness and the parts adjoining, could be seen. The case elicited much interest and favorable comment.

The post-prandial exercises were opened with an essay by G. N. P. Mead, M.D., of Winchester, Mass., entitled "A Case of Swallowing a Tooth."

(For Dr. Mead's paper, see page 380.)

DISCUSSION.

Dr. Mead.—I had an idea that what I have presented to you was something unusual, but I find, in talking with some of your members, although it has a very small space in literature, it may not be so very rare a thing.

Dr. Briggs.—I would like to ask Dr. Mead if he thinks the X-ray would have shown that tooth, and if so, what he would have done if he had discovered it there?

Dr. Mead.—I should think the X-ray would have revealed it in the beginning. Very likely after the pneumonia it might have been difficult to see, on account of thickening, which must have remained as long as the tooth was in the bronchus. The X-ray could be used antero-posteriorly through the chest wall, but I doubt if it could give the right angle of revelation which would be necessary to locate it for any surgical procedure. As to what could be done early, opening the trachea, with irritation of the bronchus, thereby hoping to have the tooth coughed out, seems to be the best method.

Dr. Williams.—I think that a very remarkable case, and it has been very clearly described, so that there will be no difficulty in anybody's understanding the case thoroughly. I am very glad we are to have it published in our transactions, in our journal. It will certainly be a rather notable thing to have on record.

Dr. Mead.—Mr. President, may I add one case that was of interest to me? It was a suit brought against a dentist who broke the crown of a tooth in the forceps and it was drawn into the trachea, the person being under the influence of gas. The piece of tooth remained in the lung one week, during which time the man had paroxysms of coughing and expectoration of blood. It was finally coughed up. He sued the dentist and recovered five hundred dollars. The decision was appealed, but the higher court sustained the verdict.

Dr. Werner.—Had the patient any suspicions of having swallowed the tooth?

Dr. Mead.—No, sir.

Dr. Werner.—And no medical diagnosis suggested anything of the complaint?

Dr. Mead.—No, sir. The pneumonia occurred in two days, and it was supposed to be from sucking blood into the lung. Both the dentist and the physician thought it was due to this.

Dr. Werner.—Infection?

Dr. Mead.—Yes.

Dr. Williams.—What was the anæsthetic?

Dr. Mead.—Nitrous oxide gas.

President Pond.—The subject is passed.

MAKING GOLD INLAYS BY MODELS.

President Pond.—Dr. Andrews will show Dr. George S. Allan's method of making gold inlays by models.

Dr. Andrews.—Mr. President and gentlemen, I think it was some time during last December that Dr. Allan sent me some of his gold boxings, which I was to show at the January meeting, but from a crowded condition of the evening's programme it was found that we had no time. It was advertised by card to be shown at the February meeting, but the same condition prevailed, and it was carried over to this meeting. In the mean time the whole thing has been published, and probably most of you have read the account of how Dr. Allen makes his gold boxings.

For fear that some may not have seen this, I will simply say that a cavity presents itself, and is shaped so that an impression taken will give a clear impression of the cavity. If there are any undercuts they are filled up with cement, or with impression material, so that the impression will come out clear. All surfaces are carefully prepared so as to be at right angles, with good substantial edges. The impression is then taken to the laboratory, a plaster model is made, and from that a cast with Melotte's metal, and a base-piece, fitting the bottom of the cavity, is struck out of No. 30 gold,—pure gold I think he uses. This takes but a little while. After it is struck up he uses a little solder, flowed on the bottom, to make it stiffer. It is then taken to the tooth and the fit is verified. Then modelling composition is placed upon it and it is shaped to the contour of the tooth. Enough is taken off to allow for the thickness of the No. 30 gauge gold cover, which I think is made of 20-carat gold, to go between the bite and the composition which is used to contour the boxing. This is taken to the laboratory, another die is made and the contour piece struck up, the impression materials removed, and the two are then soldered together and filed down to make the boxing, as he calls it, so that it will exactly fit the cavity.

Dr. Allan has sent for our inspection some of these boxings which he has made, and they are very beautiful. They are as fine as the finest gold filling to look at. And I have the models with me, which I shall now pass around.

I will say that I do not think it is always necessary to get up dies, for I have, in a plaster cast, with cotton or spunk, driven some soft pure gold to the bottom of the cavity, thus forming the base-piece, then put on my modelling composition, shaping the cavity as I thought it ought to be shaped, and have then burnished the gold on this without any dies at all, thus making the outer piece. I have made and put in two or three boxings which have given very good satisfaction.

Dr. Allan had tried a number of the porcelain inlays on the back teeth, and found that they chipped and broke so badly in many cases that he devised this method of gold inlays, or boxings. I do not know whether it is wholly his own or not.

The pieces which I shall first show I have arranged in a box, numbered one, two, three, and four, showing first the small impression cup, which is made of thin steel which we band teeth

with; it is made somewhat larger than the cavity. A little warm impression material is pressed into the cavity, allowed to cool, and removed, and there you have your impression. The next piece is the impression in the impression cup. The third piece is the plaster cast made from the impression, with the base-piece stamped up in it. The fourth piece is a piece with modelling composition arranged to form the contour, and the fifth piece is the outside piece struck up to fit over that.

Dr. Williams.—How is it retained in the cap?

Dr. Andrews.—I am glad you asked the question. When these two pieces are soldered together, of course it makes a little box on the hollow capping or inlay. Dr. Allan then files openings on the inside surface sufficiently large to let cement run in, and his idea is to fill the boxing with cement, placing it within the boxing and pressing it home with the finger, holding it while it hardens. He has had very good success. I have three teeth with the boxings here, which Dr. Allan made, and I have had my assistant put a thread around them so that you can take them out and look at them, and not run the risk of losing them. Kindly pass them around, and you can see how nicely they are made and how well they fit.

Dr. Bradley.—Are these Dr. Allan's?

Dr. Andrews.—These are Dr. Allan's, sent to me to show to the Academy nearly three months ago.

Dr. Bradley.—After fitting the impression with modelling composition you put on a pure piece of gold, and then you have to take it off to get the modelling composition out?

Dr. Andrews.—Yes.

Dr. Bradley.—How do you put it on again after you take it off?

Dr. Andrews.—It is fitted down so perfectly that it will fit in one place only.

Dr. Bradley.—What solder do you use?

Dr. Andrews.—Two or three grades lower than the gold.

President Pond.—Is there anything to be said on this subject of inlays? Quite a number of you have seen them.

Dr. Ames.—I have something here in that line which I will pass along. This is not in competition at all. I prepared this some four years ago to bring up, but I do not think it is as good as the one that you see, made by Dr. Allan. It is simply a piece of 28-gauge pure gold, contoured over a cavity and a bar soldered across,

and then the whole is cemented in. You will see one tooth that has the inlay before it is set with cement, and the other is where it is fastened to the tooth with cement. I formed it around, covering the thin edge of the tooth, grinding the edge up, contoured it with contouring pliers, and then cemented the edge of the cap; after the cement is hardened so that it is firm, I burnished the edge down so that it is closed. I have some that have been in use from two to eight years. Some have done very well, and a few have failed.

Dr. Andrews.—Mr. President, I will say that Dr. Allan has used these cappings, but he found in cases of hard mastication that the edges would come away and turn up, and it was that very thing that set him to thinking how he could make something with edges absolutely solid, so that there would be no breaking away or turning up from hard mastication. He says he thinks that this boxing meets the case perfectly.

Dr. Ames.—I will freely say that I think Dr. Allan's is a good deal better.

Dr. H. A. Baker.—Since Dr. Andrews described this method of Dr. Allan's, it reminds me of a method which I thought was quite unique. About a year ago I went before the Vermont State Dental Society. While there Dr. R. M. Chase, of Bethel, presented a method which seemed to me very practical in a great many cases, especially where a patient is unable to undergo the tedious operations of large gold fillings.

After preparing his cavity, without the undercuts, an impression was taken with a moulding preparation very similar to Melotte's mouldine. This gave him an impression of the cavity and a portion of the tooth surrounding it. In this impression was cast some fusible alloy, which gave him a fac-simile of the cavity and a sufficient amount of the tooth to get a good periphery and contour. This metal mould he takes to the laboratory and finishes as if it were in the tooth. He then removes it, and has a filling that exactly fits the cavity in the mouth. Then, before inserting it, he makes his undercuts in the cavity, also in the filling. It is then cemented in as an inlay, the same as Dr. Allan's is.

I would also say, Dr. Allan's specimens are very beautifully done, and I think practical, but it seems to me more complicated than Dr. Chase's, where one accomplishes the same results.

Dr. Andrews.—Mr. President, I think Dr. Baker would be sur-

prised to see how simple it is. It requires nice judgment and nice work.

I would say, in regard to the solid gold inlay, I think Dr. Russell, of Keene, N. H., has used them a number of years. He was one of the first. I have seen several that Dr. Russell made four or five years ago,—the solid gold inlays.

Dr. Baker.—I have seen his inlays. This method seemed a very unique one to me.

Dr. Meriam.—Mr. President, I think the forerunner of all this work, like almost every good thing, and many bad ones, started in Salem. While I am not going to say much about it, it was done by Dr. Fiske. I think he began making caps perhaps thirty years ago, and his practice at that time was to melt a globule of pure gold, place it on a little appliance he had, and flatten it out. In it was a small hole that a portion of the gold entered. The appliance was then reversed, he drove a punch in that spread it, and made it virtually in the form of a split rivet. Then he pared the edges and fitted the cavity. He also used pins, put on like Dr. Ames has used them, set in gutta-percha. But you know, if there is movement, gutta-percha may loosen in its attachment, and there was a tendency for it not to adhere, and later the cap curled up at the edges. But I occasionally see them now that were done at that time. I think Dr. Williams knows more about that than I, and I wish he would tell us.

Dr. Williams.—I think it was shortly after the society was formed that Dr. Fiske, of Salem, was a member, and a very skilful man he was in some lines. He introduced an appliance for striking up these inlays. The metal of which the studs were made was soft gold. I have one of his machines now. It must be pretty near the date that Dr. Meriam mentions. It was a very simple matter to strike up the studs. The trouble was in the anchorage: that was not sufficiently stiff, a little yielding, so that in some cases in mastication it would give way, and thus it rather fell into disuse.

But still there were advantages. In a number of cases I know those fillings or cappings lasted a long time, with great benefit to the teeth, where, indeed, I think, especially in some large cavities, a solid gold filling might have injured the safety of the tooth from its hard pressure against the walls of the tooth, and, as is often the case, from its frequent expansion by contact with hot substances. The expansion of gold under the influence of heat often breaks

down a tooth, and we do not understand why it is. This of course is not subject to that danger, and I think in many cases it preserved the tooth longer than a solid gold filling would.

If I had known this subject was to be brought up, I would have brought this appliance which I have. It is a simple little thing, but very effective.

Dr. Meriam.—Since I sat down I remember that I read a paper before the Academy on this subject, because I remember the capping being claimed by some one in New York. And Dr. Williams was kind enough at that time to bring the little appliance that Dr. Fiske had made and show it in the Academy. I know it came in a chamois-skin pouch.

A NEW TOOTH-BRUSH.

President Pond.—Anything further? If not, we will pass to the next subject. Some new appliances will be shown by Dr. H. F. Hamilton.

(For Dr. Hamilton's paper, see page 377.)

Dr. Hamilton.—Are there any questions you would like to ask about that?

Dr. Werner.—Do I understand you to claim that all brushing of the gum is injurious, whether done rightly or wrongly?

Dr. Hamilton.—I do not claim that *right* brushing is *wrong*.

Dr. Werner.—But *wrong* brushing is not *right*. That is exactly what I wanted to say.

Dr. Hamilton.—I merely claim that I have seen a great deal of harm done by brushing the teeth wrongly.

Dr. Briggs.—I think Dr. Hamilton could almost answer that question that way. It seems to me from my observation that I should agree with him entirely, that I never had seen a case of recession of the gum, pure and simple (I do not mean the pockets that we have from pyorrhœa, where later the gum becomes destroyed), that was not invariably due to the misuse of the tooth-brush or the floss-silk. A great many of the ills that teeth are heir to to-day are due to the abuse of those things. I have no doubt that Dr. Hamilton's brush is to be a great help in such cases.

Of course, the thing is to see that patients use the brush properly when they do use it, and not use it as a scrubbing-brush. As I tell them, the brush is simply a vehicle for carrying powder or

antiseptic liquid to all parts of the mouth, and not particularly to the teeth. And when people wish to shine their teeth, they should do as they do when they wish to shine their nails, use a buffer, and not a brush. You could not get a polish on your nails with a brush, and you do not get the best polish on your teeth with a brush.

Dr. Williams.—The brush seems to be very well devised for the purpose, if the badger's hair will not mat down between the rows of bristles. That of course can be told from experience. Does the badger's hair mat down?

Dr. Hamilton.—It does not mat down. It wears off rather rapidly.

Dr. Williams.—In that case the question would be whether it would become more like a piece of felt than an elastic brush made of small bristles, but elastic bristles, not so fine as badger's hair.

The best brush I have found has been Deponte's No. 1741, which I get by the quantity at Week & Potter's. They have four rows of bristles. The bristles are fine but elastic, so that they will retain sufficient stiffness to penetrate the crevices without matting down.

AN IMPROVED CROWN.

Dr. Hamilton.—I have a crown here that I showed some of the members some time ago. I have been using it since with considerable success. I have written down what I have to say about it.

(For Dr. Hamilton's description, see page 379.)

Dr. Andrews.—I would like to ask Dr. Hamilton how the trephine cuts the place in the tooth if it is an unequal surface; if it is rounded up, it must cut deeper on the sides.

Dr. Hamilton.—Yes, it cuts deeper on the side. The platinum band which goes in the root is not of equal length all the way around. In some cases it did not go all the way round, and on the labial surface there was no band at all, but that did not interfere with the general principle.

Dr. Williams.—I was going to suggest to Dr. Hamilton that his very ingenious application of the rubber tube suction struck me as capable of being employed on a still larger scale, perhaps in cases where it is desired to draw diphtheritic germs from the throats of children, with larger tubes; and I think the thing is greater than it seems from his presentation of it.

Dr. Meriam.—I wish to say also that that was one of the things Dr. Fiske did with his saliva-pump: he had some soft rubber disks

that he put onto the end of the tube. But those things do not last forever.

Dr. Bradley.—I think the crowns have such merit that if we could have them illustrated in the INTERNATIONAL DENTAL JOURNAL it would be very valuable. The cuts should be made to show the different stages of the work. It would be of very great interest, I think, to the profession in general if they could be published.

President Pond.—Is there anything further to be said on any of these subjects?

MOUTH-MIRROR.

Dr. Taft.—Among all the instruments we use in every-day practice, there is nothing which gives me greater satisfaction than a first-class mouth-mirror. Such a mirror I presented at one of our meetings some time ago, and for the benefit of those who were not present I will pass this one around. It is made and sold by Dr. W. M. Sharp, of Binghamton, N. Y. The parts are easily adjustable, as you will notice, but the clearness of the lens is what I would particularly call your attention to. The price of the mirror, complete, is one dollar. Additional lenses, plain or magnifying, can be obtained at any time at one-third the price of the usually unsatisfactory mirror sold by the dental dealers.

I think this meeting is proving to be one of the most interesting that we have had for some time. It has to do with practical every-day subjects, and we are getting a good deal of useful information. I want to speak incidentally of an interesting case, to me at least, upon which I operated recently, for the reason that I was curious to observe what the result of the operation would be. The patient was a common, but vicious, red fox, and might with propriety be added to the collection of wild animals whose acquaintance we have made through the writings of that fascinating author, Mr. Ernest Seton-Thompson.

AN OPERATION ON A FOX.

A friend of mine, who is a breeder of foxes, consulted me recently with regard to a vicious male, who every other night or so would kill one of his companions in the enclosure upon the farm where they were being raised. Extraction or excision of the four tusches, upper and lower, would, I thought, be the means of curbing his murderous propensities. The latter was the course finally decided upon. The operation was not completed without plenty of

exciting details, but, briefly told, the fox was first caught, then bagged and chloroformed. A pair of excising forceps quickly brought the four tushes to the level of the other incisors, and the pulps were then removed with a fine nerve-broach. A common rat-tail file served to nicely smooth and bevel the edges of the stumps, and to complete the operation. The next day found the animal suffering apparently no pain or other inconvenience. On the second night after the operation, however, he killed two more of his companions. About ten days after that he was seen to act queerly, running about in a circle and butting his head against stones and walls of the enclosure, and was himself found dead the next morning. While I regret to report the death of my patient, I am pleased to state, nevertheless, that, viewed from the usual surgical stand-point, "the operation was a success."

DISCUSSION.

Dr. Andrews.—I want to endorse what the doctor says about the Sharp mirror. I have one of those Sharp mirrors, and I have a number of other mirrors, but I always want that mirror. The glass is made by a microscope lens maker, and it is perfect. I never have had so much pleasure in using a mouth-mirror as I have in using those of Dr. Sharp's.

Dr. Meriam.—The subject of mirrors is up to-night, and it reminds me of what I put in my pocket. I have an ordinary magnifying mirror. I fancy it was made in Germany. I have seen it under various marks. I buy a good magnifying mirror with a white handle, etc., for between five and six dollars a dozen, and I can have a fresh one whenever I wish at a less cost than to have them repaired. I have accumulated a great stock of handles as a "by-product," which have been around the office, and I have been trying to utilize some of them within the past few weeks.

Dr. Williams.—Where do you get your mirrors?

Dr. Meriam.—I sound the different drummers that come along, and when one talks reasonably I buy of him. I used to get a very good mirror from Goldthwaite, the surgical instrument man, but I have not been in Boston so much of late years, and I have taken to buying them from people who come along.

You will see some of the handles are fitted to an ordinary chuck; others are broach-holders, explorers, etc.

NEW RETAINING APPLIANCE.

Dr. H. A. Baker.—Mr. President, under the head of presentation of specimens I wish to present a new retaining appliance. Something like five years ago I brought before this society a new retaining device, calling it a new hygienic retaining appliance for both upper and lower teeth to hold them in place after regulating, the lower one consisting of a rubber plate fitting the gum from the sixth-year molars forward, the upper edge of it extending around from molar to molar about one-sixteenth of an inch below the gum line inside, two gold bands being fitted to each first bicuspid; upon this band a globule of gold solder flowed on the lingual side of the bands; then in this solder was filed a notch. In the rubber plate was anchored a platinized gold wire about the size of a common pin, running from the plate to the notches in the band with flattened ends; then the same kind of wire running from the plate up on and between the cutting edges of the cuspids and laterals, extending round, front and back of the four front teeth, also wires anchored into the plate extending upward to about one-half the length of the crowns of all the remaining teeth and bent at right angles, and the end resting against the side, to hold them into position. To prevent the back part of the plate from slipping down a wire was brought up and hooked over in the sulci of the sixth-year molars.

The appliance I present to-night is an improvement upon the above, and it differs in the following way (see Fig. 4, page 378): In place of the rubber plate is a half-round platinized gold wire about one-sixteenth of an inch wide, with the flattened side next to the gum, and the other wires are soldered to this in place of being anchored into the rubber. To firmly hold the appliance in position a gold band is fitted around each twelfth-year molar; on the lingual surface of each band is soldered a tube which stands in line with the teeth or perpendicular, and from the half-round gold wire is soldered another wire about one-thirty-second of an inch in size, hooking over and entering the tube at the top; then around each bicuspid is fitted gold bands; on the lingual surface of each band is soldered a tube in a horizontal position, or crosswise, of the tooth; then this tube, about three-sixteenths of an inch in length, is split lengthwise. From the half-round gold wire on each side is another wire running up to the tube, and then a short piece of wire soldered

to the end of it, forming a T, going into the slot and fitting accurately inside of the tube; then the four bands are cemented to the teeth, with the wires fitting around the front teeth as above stated. This can be adapted to the upper as well as to the lower jaw. It is not intended to be removable by the patient, but can be taken out by the dentist. It is my belief that this appliance can be worn a sufficient length of time to retain the teeth without injury, as there are no places for the secretions to lodge about the teeth, for it is perfectly self-cleansing.

Dr. Meriam.—Mr. President, I would like to speak of a matter that relates to the presentation of specimens, and that is, whether we cannot have a little more made of it. We have seen to-night how we are all interested, and how valuable it is. One of the rules of the Odontological Society of Great Britain is that gentlemen who are to present specimens shall send a notice to the proper officer a few weeks before the meeting, so that all the members may know that this gentleman is to present a specimen at that meeting, and it serves as a table of record of the specimens, and it also leads to persons who are interested coming to that meeting. I think if it were a possible thing for the Academy to adopt that rule, so that we may have that record of them on the card of the meeting, it would be a good thing. Of course, we cannot do that when we have long meetings with long papers, but we can do it in a meeting like this.

Dr. Taft.—Dr. Meriam's remarks only serve to emphasize what I intended to speak of. We have, as we all know, from time to time more or less of a surplus of money in our treasury, and I know of no better way of using that surplus, and thereby helping to improve the INTERNATIONAL DENTAL JOURNAL and to increase its circulation, than by appropriating, whenever it seems advisable, a sum of money sufficient to illustrate such specimens, for example, as have been presented here to-night. This would give added interest to the reports of our meetings as they appear in the INTERNATIONAL from month to month, besides making them often more intelligible to the general reader. If the Academy approves of this idea I shall be glad to offer a motion to that effect.

Dr. Williams.—I am in harmony with Dr. Taft's idea, and I have often thought that the INTERNATIONAL DENTAL JOURNAL would be more interesting if there were a greater abundance of illustrations of specimens, appliances, etc. I should quite concur

in any plan by which surplus funds could be used for such illustrations, or whatever is judged necessary by the editor. If he makes that as a motion, I second it.

Dr. Taft.—I speak of this particularly, Mr. President, because I think we have not always been so judicious as we might be in our appropriations of money, and to express the hope that we may avoid similar mistakes in the future.

Dr. Bradley.—I said a few moments ago that if the crown Dr. Hamilton presented here this evening could be properly illustrated, it would add very much to the interest of the publication of the article. And I suppose if this retaining band, which is in two or three pieces (Dr. Baker: It is all one piece, except the band),—if the various parts of it could be illustrated, and then have it in position, it would make it very plain so that we could understand it. It would add a great deal to the description which we get from the stenographer's report. I should be very much in favor of judicious illustration.

Dr. Meriam.—I remember some years ago I was working up a directory, in connection with the Massachusetts Society, and I worked with the purpose of finding out what there was in Boston. My purpose was to list in the directory the name of every man in the section who would be of service to dentistry. We have fine machinists all over the city. We have a maker of fine tools up in Springfield. We have these things all around here. I say there is no spot in America where the resources of dentistry are better than right here in Boston. They have not got what we have anywhere else.

Dr. Bradley.—In order to bring this before the Academy, I will move you, sir, that the devices offered by Drs. Hamilton and Baker be illustrated, at an expense that will be satisfactory to the Executive Committee.

So voted.

On motion, adjourned.

CHARLES H. TAFT,
Editor American Academy of Dental Science.

ACADEMY OF STOMATOLOGY.

A REGULAR monthly meeting of the Academy of Stomatology of Philadelphia was held at the rooms of the Academy, 1731 Chestnut Street, Philadelphia, on the evening of March 26, 1901, the President, Dr. J. T. Lippencott, in the chair.

INCIDENTS OF PRACTICE.

The President.—The evening is, by recommendation of the Council, to be devoted to incidents of practice, and such are now in order.

Dr. Gardiner.—I would like to mention a process of immediate root filling suggested to me by Dr. Nichol, which for the last few months has given me increasing satisfaction. It is applicable both to the filling of canals from which the intentionally devitalized pulp has been removed and to cases of putrescent pulps and abscess either with or without fistula. The procedure is practically the same in all cases. After first removing the pulp and the *débris* thoroughly, the canal is reamed to, but not through, the apex with a Gates-Glidden or other similar drill, thus removing that portion of dentine next to the pulp which contains the more animal matter. Formalin is now applied to sterilize the root, which is then dried out and filled. This procedure requires but a little time in a single-rooted tooth, probably from a half to three-quarters of an hour. In one with three canals it would, of course, take a correspondingly longer time, usually about an hour. I have tried the method in some of the worst cases of putrescence which I have had, in order to thoroughly test the method, and I was particularly gratified with the treatment of a case of blind abscess which came in recently. I tapped the tooth, and there was free discharge of pus and serum. Two days later, there being no discharge, I reamed out the canals to the apex, thoroughly sterilized them and filled the canals. The tooth has remained thoroughly comfortable. I had the same result with a case where the pulp was dying. It had given considerable trouble and had been filled temporarily, but it had now reached the point where there was no doubt about the ultimate death of the pulp. I opened the tooth and removed the pulp with vapocaine, and filled the canals to the apex, after reaming them out and sterilizing. The patient was perfectly relieved of all discomfort.

(Replying to Dr. Huey.) I have been using the forty per cent. formaldehyde in full strength, but take care not to saturate the canals, simply moisten and wipe them out so as not to have any excess. So far I have had no trouble. I think one might have trouble very readily by the too free use of it. I think that five per cent. of formalin would be strong enough for all purposes, but I have been using forty per cent. simply as a matter of experiment. I have, however, used it with extreme care, and would not recommend it. I thoroughly dry the canals before filling with gutta-percha to the apex. I have been testing this method now for several months, and so far I have not had a single case that was not satisfactory in every way. I would say that this method of immediate canal filling has given me more satisfaction than any new process which I have adopted or tested for a great many years.

Dr. Roberts.—I wish to speak of the immediate removal of pulps by means of pressure anæsthesia, and, as the thing is new, will give to you my first and second experiences. In the first I had I went ahead very slowly, and it took me an hour to obtund, get the pulp out, treat the root thoroughly, and fill it with a temporary cotton dressing. In the second case, which was in the same mouth, after getting the rubber dam on it took me eight minutes to open into the tooth and remove the pulp without any pain to the patient beyond that from the first action of the ethyl chloride, used to benumb the pulp in order to get an exposure. In another case, in which fortunately there was no hemorrhage, I had removed the pulp and filled the root in eighteen minutes.

I have had but one failure, I believe, and I could not understand that. I could bring a great deal of pressure on the unvulcanized rubber, but could not enter the tooth, though I had a free exposure. I made an application of arsenic afterwards, but I could not find the pulp or any sign of it. Consequently I do not know what caused pain, or what it was that was sensitive.

Five per cent. formalin is as strong an antiseptic as is necessary, as any one who has had a toothache coming from formalin placed upon an exposed pulp will agree. When formalin is put, for instance, into the posterior nares or upon a wounded surface, we are reminded of our boyhood days when we robbed the wasp-nests.

I have filled immediately after removing the pulp and also after introducing a dressing of carbolic acid on cotton, and unless there is some special reason for immediate filling, I would prefer.

where the pulp has been freshly removed, to place a dressing of carbolic acid, so that the wound at the apex may heal. It may be unnecessary.

Dr. Gaskill.—In experimenting with the pressure method I find cocaine to be unnecessary. The anæsthesia is from the pressure and not from the cocaine. It can be done with absolute alcohol only. Simply make pressure, and the same results are obtained. In the first case tested, I had the pulp out in two minutes. Of course, that was a very accessible tooth,—a lateral with a large cavity. In the other cases, where there was no cocaine used, the results were just as satisfactory; in other words, four or five minutes were required to remove the pulp.

Dr. Kirk.—It is a notorious fact that in dentistry, as well as in every other profession, ideas seem to diffuse slowly, very slowly in some cases. It is rather interesting to me to-night to hear this discussion of formalin, when I remember that it was eight or nine years ago that Dr. Mascort, of Paris, came into my office and offered me an ounce vial filled with “formol,” which is, like “formalin,” a forty per cent. solution of formaldehyde in water, and told me that in one of the hospitals in Paris this preparation, diluted, had been used indiscriminately and with uniform success by one of the medical or surgical staff for the treatment of cases of toothache, no matter whether they came from exposed or putrescent pulps. Within a few days after getting my preparation from Dr. Mascort I divided the bottle with Dr. Jack, and told him the story, and he tells me just now that he has been using formalin in his practice for this purpose more or less ever since. It seems to me that it is an ideal substance for the purpose which has been described here to-night. It has certain properties which make it extremely valuable. In the first place, it is an excellent germicide. In the second place, it has a peculiar tanning effect on albuminous or gelatinous matter. Thirdly, it is volatile at the ordinary body temperature, and will expand beyond the apex and bring about sterilization of the canal and, to a limited degree, of the periapical region, if the preparation is properly and carefully used. When Dr. Gardiner says that he uses a forty per cent. solution with safety, I take it for granted that he uses it with extreme caution and in extremely small amounts. It is a well-known fact that formalin is horribly irritant and destructive of vital tissue, and its use is dangerous unless that fact is kept in view and unless it is

used in extremely minute amounts. In the clinic at the Dental Department of the University of Pennsylvania it is used quite extensively, but in not over two per cent. solution; even a one per cent. solution is strong enough. In histological or pathological work it is one of the best fixing agents, and a five or ten per cent. solution will harden tissues very rapidly. Tissues one inch thick can be hardened in twenty-four hours with a ten per cent. solution. It may be a beneficial thing if used within the limits of safety, or a very irritating thing if used in excess.

Dr. Gaskill.—I have used formalin, and in several cases I found a slight periostitis the day after filling the root, but it subsided, and I have yet to recognize a failure in any case where I have used it.

(Replying to Dr. Kirk.) I use a five per cent. solution. I have simply wiped out the canal in several instances. There has been a slight soreness, but in twenty-four hours that has entirely disappeared.

Dr. Roberts.—I have been using a five per cent. solution for four years, and have never had any soreness following the use of it, but I have used enough on cotton to wipe out the cavity, leaving it in only a few seconds. I then wipe out and dry the canal, and fill with my canal seal. I prefer not to seal formalin in the root.

(Replying to Dr. Hickman.) After using the formalin, as a rule you do not need much antiseptic dressing. I simply use carbolic acid. It coagulates; the formalin also coagulates. I have used a five per cent. formalin root-canal dressing and kept it in for two or three days where I have failed to stop a tooth, and kept it comfortable. Where a root-canal refuses to be comfortable with any of the essential oils, it will remain comfortable under a five per cent. solution of formalin for a couple of days, and I have never had periodontitis follow its use. I have had it follow the sulphuric acid treatment.

Dr. Huey.—May I be allowed to digress for a moment? The question of coagulation under formalin has been brought up. I am in the habit of making polishing wheels of corundum and gelatin which is coagulated with formalin, and they are hard enough to do very good polishing in the mouth. I merely bring this up to show the power of formalin to coagulate albumin.

Dr. Darby.—It occurs to me that possibly it would be interest-

ing to the members to have me repeat what I said at Old Point Comfort about a rapid method of devitalizing the pulp. Possibly you have read of what I said on that occasion, but I have brought with me the little instrument with which it is done, and will describe in the fewest words possible my method of devitalizing a pulp almost instantaneously. I first discovered this about a year ago, when I inadvertently broke off a lateral incisor, decayed on both mesial and distal surfaces. The tooth was a vital one, and the lady was going away the next day. It was necessary that I should do something. I said nothing to the lady, but took a very sharp new bur, revolved my engine very rapidly and cut through the dentine until I approached the pulp, and made a good exposure. I then touched a crystal of carbolic acid to the pulp, and it at once made a white eschar. It then occurred to me that I could inject into that pulp some chloroform and carbolic acid. I filled a syringe with equal parts of chloroform and carbolic acid. The nozzle I put into the pulp-chamber and packed a little gutta-percha stopping around it. I then attached the syringe and forced the piston down, but my patient did not wince. Instantly I twisted the pulp out with a sharp broach. It was as white as any piece of tripe or skin tissue. I said to my patient, "Did I hurt you?" She said, "Not at all." I put on a Logan crown temporarily, and sent the lady away.

In another case, for bridging purposes, I drilled into each of two sound incisors with a sharp bur, exposing them; then took a crystal of carbolic acid and carried it into my drill opening. I packed the canula in with gutta-percha. In less than three minutes I had both pulps out, and they were blanched as white as a ghost. I have done it in a half-dozen cases, and each time the patient has said, "It does not hurt in the slightest degree." I give it to you, gentlemen, for what it is worth. It is carbolic acid and chloroform, equal parts, injected by gentle pressure. This is a French syringe, a glass barrel with a glass piston. These are absolutely air-tight. There is no needle attached, simply a canula.

(Replying to Dr. Huey.) These cases were all single-rooted teeth, but I tried it in molars, and it had the same effect. You will find that your anæsthetic goes up the root with perfect ease. The method seems especially applicable to those exposures which we meet with in single-rooted teeth where you can introduce the canula

a sixteenth or an eighth of an inch and pack your gutta-percha around it.

Dr. Guilford.—It is the general practice now to employ pressure anæsthesia, and if Dr. Darby would try that he would not wish to use a syringe again. Instead of using a special instrument and packing the gutta-percha or temporary stopping around it, he could accomplish the same result with cocaine and carbolic acid, a little unvulcanized rubber, and a ball-burnisher.

Dr. Darby.—Do you hurt your patient?

Dr. Guilford.—Only for an instant. At the first moment of pressure there is a slight sensation of pain, but after that there is none. The pulp is removed painlessly and always comes out white. There is sometimes a little hemorrhage after a moment or two, but I do not object to that; indeed, I prefer to have a little bleeding, as it tends to relieve any possible congestion. The method is perfectly simple and thoroughly effective.

Dr. Darby.—I would like to have Dr. Guilford tell me how, in such a case as the first one I mentioned, when there is nothing but a peg sticking down from the gum, he will be able to make pressure?

Dr. Guilford.—You simply put the unvulcanized rubber over the opening where you place the drug.

Dr. Darby.—You have no opening.

Dr. Guilford.—The moment you expose the pulp you make one. Dr. Gaskill tells us he has used alcohol in the same way.

Dr. Darby.—Where you have the cavity of decay, that is all right.

Dr. Guilford.—You do not need a cavity of decay, only an opening into the pulp.

Dr. Darby.—How much cocaine do you use?

Dr. Guilford.—A mass about the size of a pin-head: just as much as you can lay on the surface exposure. The rubber will produce pressure sufficient to force the medicament thoroughly into the pulp.

Dr. Duffield.—I have for a year been removing pulps by the method described by Dr. Guilford, but I have been using a solution of hydrochlorate of cocaine in acetic ether, which I think an advantage.

Dr. Darby stated that the society had the endorsement of the Council to listen to the remarks of Mr. J. W. Place, who possessed

a new method of making seamless crowns, and that the appliances he had with him were neither patented nor patentable. It was decided to first adjourn the meeting, and then to allow Mr. Place to speak and make his demonstration.

Adjourned.

OTTO E. INGLIS,
Editor Academy of Stomatology.

Editorial.

WHAT SHOULD BE NEXT IN ORDER?

EACH day, week, month, and year brings its changeable duties, and he will be a wise man who can regulate in advance the direction of the life-current or where it will land the individual, the association, or the community. The world at large is full of surprises. One year the Autocrat of all the Russias will call the nations together to formulate plans for the preservation of the peace of the world, and before that world has had time to digest the contents of the signed contract of the Powers, war has become the universal thought and the universal practice. What is true of nations is true of the individual, and it is this uncertainty that is always attractive if not always standing for true progress.

The intellectual world, of which dentistry should form a part, is subject to the same surprising fluctuations. This should be expected, for, after all, mind is the motive power behind all these movements, and the fact that nations are unrestful presupposes an internal mental force that will change the character of all social conditions. While the upheavals are not always for the good of peoples, they invariably indicate a mental activity that must eventually end somewhere and somehow in the uplifting of the race and the betterment of those civilizing tendencies that are the marking stones of progress.

These reflections belong particularly to this period in dental education, as well as to dental work in general. It would be an anomaly to have dentistry quietly stranded while the torrent is rushing through the greater world to more enlarged aspirations and

more notable results. This has not heretofore been the condition of this the new-born of the professions. Its vigorous life has kept it in the van of progress, but to remain there means constant vigilance and a constant subjugation of selfish aims.

It must be apparent to all reflecting minds that the educator is the leader of the people. That the school-master has been relegated to a somewhat inferior position is true, but the world has not yet come to a period when it is capable of analyzing the forces that move it onward in a spiritual and moral sense. When that time arrives the teacher will occupy, as he or she should do now, the loftiest pinnacle in the world's regard, and it is strange that it is not recognized that behind kings and emperors, power and dominion, stands always the teacher guiding and directing the unseen, oftentimes unfelt, but always the potent force that directs the world in its onward march for good or evil. The teachers of every age have been nailed to a cross, and the cruel death of the great Master-Teacher of the ages simply typifies the eternal injustice accorded to these the saviours of the race, who combine within themselves the uplifting power that has universally tended to a more refined civilization.

The application of these truisms is not difficult. We need a higher appreciation of those who have been leading the dental hosts than has been accorded them. The dental college teacher is simply following in the wake of his clan in other fields of work. He probably would not have it different, so far as his individuality is concerned, but that which does trouble him is the indifference, the almost contempt, which seems to be felt for his efforts to raise the dental profession to a higher level. The colleges, and by that is meant the teachers, for bricks and mortar are soulless, are the choice mark for the man on the retrograde. They are to him an everlasting sign of his own weakness, and hence his antagonism. In his personality are represented the retarding forces that would, if they could, relegate civilization to aboriginal conditions, the age of the implements of stone.

The teachers of this day in dentistry ask that the profession continue to move steadily forward to higher levels. They have not urged this in vain, for much has been gained, and, while progress has been slow, there has been no backward step taken. It is, however, a truth that as a body we seem to have been turned out of the deep current and are floating in shallow waters. This may not

be apparent to all, but to the writer there are unmistakable signs that the good ship is not moving as rapidly as would seem desirable. Is this the fault of the crew or of uncontrollable circumstances? To drop the figure, are we doing all that is possible to meet changing conditions? It would seem that we have not been doing all that is possible, for the fruits by which we are to be known are not satisfactory. The teachers may be there, but if so, there is something wrong in the teaching.

The lamentable exhibit at Washington recently of only two passing the board out of fourteen examined, while it may not prove this to be true, goes very far to demonstrate that there is a defect which needs remedial aid, and that very speedily. It is possibly true that the army board may be partially to blame in this instance, for commissions are very apt to go wrong even when most intelligently constituted, and it may be considered an open question with this one; but, allowing for all this, it is quite evident that the unlooked-for result means for the dental colleges a more stringent method, if not a new standard of training.

The Surgeon-General possibly unwittingly hit the nail directly when he stated that he wanted practical men as contract dental surgeons. It is just here where the dental profession is standing to-day. It needs practical men.

The early work of dentistry developed this class, but failed to enlarge the intellectual horizon. The subsequent periods have sent the minds of the students into a region of scientific knowledge and unfitted them, in a large degree, to follow in the footsteps of the Fathers and become practical men. At a recent meeting of one of our societies this dividing line between past and present was singularly evident in a discussion of why teeth were checked, cracked in crown-work. The young men had their theory, and charged it on the porcelain; the old men retorted that checking and cracking was almost unknown in the practical days of silver and gold plates. The contention typified the two ages and could not be harmonized.

The question is now, How can these two conditions, seemingly so antagonistic, be brought into harmony? We have talked about it, and the two teaching associations have spent laborious hours in attempts to solve the problem, but it practically remains in its present unsatisfactory state.

It is not the purpose of this article to point out the way. The

problem is too deep, too far reaching, to be settled in the limited space of an editorial, but the subject-matter must be considered, and that by many minds, in the near future. How may we combine the practical with the theoretical without sacrificing either? We do not want rivers of words, but we do need, sadly need, practical suggestions that will lead us out of the almost pitiable situation in which we are at present placed. We need teachers, not mere men. We must have those capable of imparting the knowledge they may possess. We should have more time, and the National Association of Faculties will be negligent in its duty if it fails at its next meeting to add another year to the course; indeed, it will amount almost to a crime to stop progress. Practical men cannot be made as things now are. Why, then, hesitate? While it would be well to advance the entrance requirement, if anything must be sacrificed let it be that, but give the colleges at least time to teach. The Association of Dental Faculties has the power to effect this. At its next meeting the question will come before it. Let it not be said that the members left Milwaukee with the reflection that they failed in a manifest duty, and by thus doing placed the accomplishment of those things that make for progress in our profession to a day remote in the future. Are we ready to direct our ship from sluggish waters to the broad current of the new stream, so clearly manifest in the not far distant future, and which can be realized in part in the present if we are true to ourselves, true to our profession, and true to that high position which belongs to us as teachers in this important work?

DEATH OF WILLIAM HENRY MORGAN, D.D.S.

INFORMATION of the death of Dr. Morgan came too late for extended notice in this number. This will appear in the July issue.

His departure, coming, as it has, almost immediately after the death of Dr. McKellops, is a silent but none the less positive reminder that the builders of our profession in the United States are fast passing away. Of these, Dr. Morgan was one of the most active and influential.

He died at his home in Nashville, Tenn., on Thursday morning, May 16, 1901.

Bibliography.

OUR TEETH AND HOW TO TAKE CARE OF THEM. By Victor C. Bell, M.D., D.D.S. Young America Publishing Company, 111 Fifth Avenue, New York.

This book has been prepared by Dr. Bell for the use of young children as a text-book in our schools. For this purpose it seems well adapted, and care has been taken to make it interesting through carefully prepared illustrations. The book is well arranged in short chapters, followed by a series of questions.

For the age, presumably, from six to ten years this little primer would be all that would be necessary, but for children of larger growth and more cultivated understanding something more should be given.

It is a gratification, however, to find that the trend of educational thought is towards the training of the young mind to the care of the body. The great effort heretofore has been the cultivation of the mental powers, permitting the health to be looked after by the medical attendant.

The time must come when the medical man and the dentist will be required as an essential part of the staff of all well-regulated schools. Sanitary science should be a necessary part of the curriculum, and in this should be included the care of the oral cavity.

This little book is, therefore, welcomed as an entering wedge to force the conservative element asunder and admit into our public-school system dental teaching, to include all that is important for a young person to know regarding the mouth as a whole.

If the world is ever to be educated to the importance of the teeth and the intimate relation the mouth holds to the entire system, it must be through the education of the young, not exclusively under the parental roof, but in the schools of the country. The quicker this great fact is learned by our school-boards the better it will be for the health and intelligence of future generations.

POEMS OF THE FARM, AND OTHER POEMS. By Charles Nelson Johnson. Chicago: Daniels Company Press, 1901.

Poetry and dental science have not been in harmony for at least two generations. In the earlier dental periodicals the searcher into

dental history will find occasionally the older dentists dropping the ordinary prose for what they pleased to denominate poetry, and even to-day some of our trade contemporaries try to give a flavor of sentimentalism to the commercial side of these journals by a touch of doggerel verse.

It has, however, been left for a prominent dentist of the year 1901 to give us a genuine book of poems which appeal to two phases of human nature, the humorous and the better life of our common humanity.

The volume is modestly presented by the author without, as he says, "the slightest pretension to merit. In truth, they are not, strictly speaking, presented to the public at all." With the first statement very few readers will agree. To the writer they not only possess merit, but it is a question whether they do not equal some of the best in our literature.

The dialect poems relating to farm life fill up nearly one-half of the volume. The temptation to quote portions of several can scarcely be resisted, but space will not permit. To one sated with the menus of the club the poem dedicated to "An Old Boiled Dinner" will specially appeal. The author says,—

"You may talk about your ices
Filled with gastronomic vices,
You may talk about your soups so thin—or thinner,
On your menu's polyglot;
But there's nothing hits the spot
Like a steaming, fragrant, old boiled dinner."

That the author lived on a farm in his boyhood days is very evident, for no one could write so feelingly of farm work and "Doin' Chores on the Farm," unless he had worked from "Diggin' Turnips in the Fall" until the last spear of oats had been ingathered, or until, as the author expresses it, "I have raked and bound in harvest till I wisht 'at I was dead." Many, doubtless, can find this description one of the treasures of memory:

"In the mornin' bright and early, just before the break o' day,
Crawlin' out from under blankets where you'd give the world to stay,
Tuggin' at a pair o' cowhides frozen stiff from overnight,
Pullin', strainin', stampin', shiverin' in the dim, uncertain light."

One of the most characteristic pieces in the collection, and true to the life it is intended to represent, is the one entitled "The

Horse-Race at the Corners." It is worthy of reproduction here, for, while the critic might not call it poetry, it belongs to that class of rhymes that made "The One-Horse Shay" and Oliver Wendell Holmes equally famous.

The author's love of children is presented in the closing pages of this interesting volume. The poems here are the genuine outpouring of a heart full of love for the little ones expressed in this verse:

"What is home without the children?
Just an egg without the meat—
Just a nut without the kernel—
Just a sun without the heat."

That the author has found the time and inclination, after the absorbing and exhausting work of his profession, to cultivate the higher inspirations is an evidence that the spirit of man will at times overcome the shackles of environment and rise superior to the daily unpoetical duties of professional life.

Miscellany.

WEIGHTING A FULL LOWER DENTURE.—When I once thought it necessary to increase the weight of a lower set of vulcanite, I simply packed inside the rubber small strips of lead or tin. I have long since ceased to realize any special benefit from extra weight. For many years I advocated the use of cast-metal plates. A few years since, I was obliged to resort to a full denture. For my second plate, as the jaw is very flat and narrow, I used a cast-metal plate. To my surprise I found it would not answer at all. There was no ridge to prevent its sliding forward or sidewise. If I leaned forward to speak to a student, the plate slid forward. Upon lying down in bed, it would slide sidewise.—L. P. HASKELL, *Dental Brief*.

HOW TO LIGHTEN FULL UPPER CASES WITH SIDE-BLOCKS.—In the first place, do not use the blocks. Plain teeth can be articulated far better. But why wish to lighten them? Weight cuts no figure in a properly adjusted upper denture. I do not consider it

a factor in any case whatever. As evidence, I have been putting in continuous gum dentures for fifty years, and find weight no objection, and have constantly replaced rubber plates with them, and no complaint comes of weight.—L. P. HASKELL, *Dental Brief*.

POSSIBLY A VALUABLE DRUG.—An Indian medical journal publishes a description of a curious plant which grows in Arabia and parts of the western frontier of Hindustan. It is popularly known as “the laughing plant,” on account of the effect produced by eating the seeds. The plant is of moderate size, with bright yellow flowers and soft, velvety seed-pods, each of which contains two or three seeds resembling small black beans. The natives of the district where the plant grows dry these seeds and reduce them to powder. A small dose of this powder has similar effects to those arising from the inhalations of laughing-gas. It causes the soberest person to dance, shout, and laugh with the boisterous excitement of a madman, and to rush about and cut the most ridiculous capers for about an hour. At the expiration of that time exhaustion sets in, and the excited person falls asleep, to wake after several hours with no recollection whatever of his antics.—*Public Health Journal*.

A NEW METHOD OF MAKING DUMMIES.—After the abutments to which the dummies of a bridge are to be attached are made, porcelain teeth are ground into place to articulate with the opposing teeth. The porcelain teeth thus articulated are waxed together, and an impression of them is taken in mouldine, and a die is poured, upon which No. 28 gold plate is swaged directly into lead, using no counter-die. A mould in gold thus formed is flowed solidly full of solder or is backed up with gold and soldered. This is then filed up to fit between the two crowns already formed for the bridge and the whole soldered together, and thus a solid gold bridge is obtained.—DR. J. K. SMITH, *Dental Register*.

THE URIC ACID DIATHESIS.—James Tyson holds that the uric acid diathesis is remediable in two ways,—first, by limiting the ingestion of nitrogenous food, whence uric acid and its congeners

are derived; secondly, by increasing the quantity of the water constituent of urine and by alkalizing the blood and urine with the view of favoring solution and elimination of uric acid. There is no contraindication to the use of carbohydrates and hydrocarbons, provided they do not produce acid fermentation. Nor is there any objection to the use of fruits which are not acid. Exercise, bathing, and massage should also constitute part of the treatment. The alkaline bases should be administered, principally the salicylates, the citrates, and bicarbonates.—*Medical Record*.

ALCOHOL AS AN ANTISEPTIC.—The *Hospital* has this to say in regard to alcohol as a disinfectant, particularly for the hands. The article gives the results of experiments of Salzwedel and Elsner, made in Koch's laboratory. "They maintain that these researches show that alcohol is of use in preparing the hands for operations, not merely because of its hardening effect on the epidermis, but also as an active antiseptic; in this respect they assign it a potency intermediate between carbolic acid and corrosive sublimate."—*Medical Record*.

TO REPAIR A FRACTURED PORCELAIN FACING ON A FIXED CROWN OR BRIDGE.—I forget to whom I am indebted for the method, but I use little platinum tubes of the diameter of a pin. The pins are cut off close to the porcelain and the tubes are soldered on with pure gold. Two holes, corresponding to these tubes, are drilled through the backing and the tooth is tried in. The length of the tubes is marked off, the tooth removed, and the tubes cut off. The tooth is then replaced with cement and fixed in position with an Ainsworth punch, by pressing the tubes so that they form a rivet. The inside of the tubes is packed with amalgam or gold. The efficacy of the method is remarkable. I have used this method of repair since it was given three years ago, and it is very convenient.—DR. D. HEADRIDGE, *Journal of the British Dental Association*.

[If a bevel is given to the inner ends of the holes, the ends of the tubes can be made to form rivets, and, besides, it will facilitate their being filled with either gold or amalgam.—J. A. McC.]

METHOD OF SAVING A BADLY DECAYED AND FRACTURED ROOT.—At the eighth annual clinic of the Alumni Association of the Chicago College of Dental Surgery, Dr. Keefe, of Chicago, gave a clinic illustrating the method of saving a badly decayed and fractured root by extracting, preparing, and banding outside the mouth and then replanting. The tooth treated was an upper right lateral, which was badly decayed, and fractured upon the labial side to the process. After extracting, the canal was cleaned and filled with gutta-percha and a silver band fitted to the cervical end, as would be done for a crown. The band was made wide enough to reach the margin of the gum. The root was then replanted and will be crowned when the parts have assumed a healthy condition.

Dr. Keefe exhibited several X-ray illustrations of other teeth replanted during the past eight years for similar reasons.—*The Bur.*

KOWARSKA'S PASTE.—Kowarska's paste is composed of celluloid, one hundred and fifty-five grains, and acetone, five hundred grains. It is used to retain loose teeth in position and to cover the sensitive necks of teeth. The method of Dr. Hinkins, of Chicago, in the use of Kowarska's paste for holding loose teeth in position is described in the *Dental Review* as follows:

"This procedure is to ligate the teeth together, not in the figure-of-eight style, but by tying the silk about the tooth and making several knots with silk, enough to fill nearly the interdental space; then to encircle the next tooth and tie knots again in the interdental space, and so on, until all the loose teeth are secured. Then with this cement, which is made of celluloid C. P. and acetone C. P. dissolved together to make a thick creamy mass, the parts are held firmly together. Apply the cement about twice as thick as desired, because it shrinks."

No doubt other uses will be found for this paste, but it must be kept in mind that it will become foul like all preparations of celluloid, much more so than when prepared in the usual manner for plates.

ALUMINUM VERSUS GOLD FOR CLASPS.—The teeth embraced by gold clasps are especially prone to decay on the surface covered

by the clasp. For nine years I have frequently used aluminum for clasps, and not one has caused any trouble. Not once have I seen any bad results from the use of this metal.—H. R. NEEPER, *Dental Digest*.

[The above is taken from the *Pacific Dental Gazette*. In regard to the use of aluminum for clasps, it lacks the essential quality of clasp metal,—namely, elasticity. Besides, the loss of tooth-structure under a clasp is caused by chemical solution, not mechanical abrasion. The food deposits beneath and about the clasp undergo lactic fermentation, and the lactic acid there formed dissolves the tooth-structure. The preventive measure is absolute cleanliness, hence should be as likely to occur under an aluminum clasp as under a gold one.—J. A. McC.]

A FLUID FLUX THAT DOES NOT PIT.—This consists of a saturated solution of equal parts of boracic acid and borax. It is prepared in the following manner:

Mix equal parts of boracic acid and powdered borax and place them in sufficient water to get a saturated solution. This may be determined by a slight residue on the bottom of the receptacle.—DR. DODEL, *Ohio Dental Journal*.

TO HOLD INLAYS WHILE CUTTING THE GROOVE.—In cutting the groove around an inlay before cementing it in the cavity, much difficulty is experienced in holding the very small inlays. This can be overcome by sticking the inlay to the end of a piece of orange-wood with shellac, which holds it firmly and permits the operator to cut the groove readily.—C. F. ALLEN, *Dental Review*.

USE OF RUBBER DAM IN INLAY WORK.—The greatest help we have had recently in inlay work is the method, introduced by Dr. Reeves, of using rubber dam or any similar substance for holding the matrix to the cavity during the final burnishing.—C. N. THOMPSON, *Dental Review*.

Obituary.

HENRY J. McKELLOPS, D.D.S.

DR. H. J. McKELLOPS died at his residence, St. Louis, Mo., April 23, 1901. He was born in the State of New York, at Saline, near Syracuse, on the 31st day of August, 1823. His father, James McKellops, died when the son was yet in his tender years.

As early as the year 1840 young McKellops went west with his mother and sister to the city of St. Louis. His education began in the city schools. Being a very active and intelligent lad, he had no difficulty in obtaining a position as messenger boy in the Missouri Legislature. In this employment Dr. McKellops made his first money, and proceeded at once to invest this in tuition at the Missouri State University, at Columbia, to which place his mother moved and remained for two years, while her son applied himself to his studies. The family returned to St. Louis in the year 1844, when young McKellops took a course of book-keeping in the Mercantile College. On the completion of this course, through kindly assistance, the young student secured a place in the city register's office.

About this time Dr. McKellops was attracted by the study of medicine and dentistry. He took a course of medicine, in the years 1846 and 1847, at the old St. Louis Medical College on Washington Avenue; but, through the persuasion of his brother-in-law, who was a dentist, he was drawn to the profession and practice of dentistry, and in a very short time, owing to his natural ingenuity and love of mechanical arts, became an expert operator. He opened his first office in Captain Elihu H. Shepard's building on Fourth Street, and at once stepped to the front rank of his profession.

In 1855 the Ohio Dental College conferred the degree of D.D.S. on him, and in 1864 he introduced the use of the mallet in London and Paris. It is hardly necessary to follow Dr. McKellops through his long and successful career in the city of St. Louis. His skill as an operator was early recognized, and secured him the patronage of the first families of the city. His fame extended outside of the city, through the State, and eventually through all the States of the Union. He was studious in his profession, inventive in his practice, always keeping to the front in whatever step of progress

was made in dental surgery. He gave much of his time to the organization of Dental Societies and Associations, in the proceedings of which he always took a leading part. He was president of the Western Dental Association, first president of the Missouri State Dental Association, afterwards in turn becoming president of the American Dental Association and the Southern Dental Association. He was president of the St. Louis Dental Society. The selection of Dr. McKellops for all these important positions gives the best indication of his standing in his profession at home and abroad.

Dr. McKellops also has a military side to his career. He was elected captain of the St. Louis Cadets, an organization of young men commissioned by Governor Edwards in the year 1843. In 1845 he was made captain in the St. Louis Legion, and in 1846 commanded the Morgan Riflemen in the six months' service of the Legion in the Mexican War, making the noted six-months' expedition under Colonel Alton R. Easton, going south on the steamer "Conway" to New Orleans, thence to Brazos, Santiago, and up the Rio Grande to Matamoras. At the organization of the famous St. Louis National Guards in the fifties he enrolled himself as a member, and saw his first service in the riots of those days. Afterwards, in 1858, as assistant adjutant-general of the First Brigade, First Division, of Missouri Volunteers, he marched across the State with the expedition under General D. M. Frost, to put down the invasion of "Bushwackers" and "Jayhawkers" who were ravaging the western counties of Missouri.

Dr. McKellops was married on the 1st day of April, 1849, to Miss Annie Gower, of Tennessee, to whom eight children, five sons and three daughters, were born. Five of these survive, four sons and one daughter.

Dr. McKellops's labor in dentistry consisted principally in associative effort. In this, however, he did a great work. No man, among its many members, was better known or was more energetic in furthering the interests of the American Dental Association. No matter how far the meeting was held from his home, Dr. McKellops was always present; and when the National Dental Association was formed upon the destruction of the American, he transferred his interest to that body. He attended the meeting of that organization at Old Point Comfort in 1900, but it was evident, to the sorrow of his friends, that the energy that had helped to

make these annual gatherings scientifically and socially delightful was no longer there, and that soon we would be forced to write, It is finished.

His aim was always for the highest in practice, and it is believed that he had, probably, few, if any, superiors as an operator. His poor health forced him out of practice some six months before death came to his relief. He was fully conscious that the end was near, and so stated to a friend who called on him two days before his final departure.

His funeral took place under the care of the St. Louis Lodge of Elks, the honorary pall-bearers being Drs. G. A. Bowman, E. H. Angle, Emma E. Chase, and A. H. Fuller.

RESOLUTIONS OF RESPECT TO DR. H. J. McKELLOPS.

At a special meeting of the Society of Dental Science of St. Louis, held Monday evening, April 29, 1901, the following resolutions in memory of Dr. H. J. McKellops were unanimously adopted:

WHEREAS, In the death of Dr. H. J. McKellops the dental profession has sustained a great loss which will be felt throughout the length and breadth of two continents; and

WHEREAS, The members of the profession in St. Louis, and especially of this Society, who best knew the depth of his friendship and felt the inspiration of his example, will mourn his loss most deeply; therefore, be it

Resolved, That the Society of Dental Science of St. Louis hereby expresses its full appreciation of the valuable services rendered our profession by Dr. McKellops during his long and active life; and

Resolved, That in recognition of his distinguished services and the great honor in which he held his profession, a suitable biographical memorial be prepared and framed, with his photograph, and hung in the rooms of this Society; and

Resolved, That a copy of these resolutions be sent to the family and to the dental journals, and spread upon the minutes of this Society.

EMMA EAMES CHASE,
HERMANN PRINZ,
B. L. LISCHER,
A. H. FULLER,
Committee.

ST. LOUIS, Mo., May 1, 1901.

SIR EDWIN SAUNDERS, F.R.C.S.

It is with much regret that we have to record the death on March 15 of Sir Edwin Saunders, at "Fairlawn," Wimbledon Common. Born in 1814, his long life closes with a century which must be memorable in the history of our profession; to the making of that history, so far as it concerns dentistry, Sir Edwin played a considerable part. When the first efforts were made towards united action in 1856, Sir Edwin Saunders was among those who petitioned the Royal College of Surgeons of England to give a status to practising dentists by means of examination and diploma. And though this end was obtained later, it was not until the College had received a special sanction from Parliament that the first dental qualification was instituted.

For the mutual interchange of experience in dental matters the Odontological Society was formed. The name of the Society was suggested by Sir Edwin Saunders, and the preliminaries were arranged at a meeting at his house in George Street, Hanover Square. It was in his house also that some of the earliest administrations of ether took place.

Sir Edwin was twice elected President of the Odontological Society, in 1864 and 1879, and his portrait, painted by subscriptions of his professional friends, was presented to the Society.

As a stepping-stone to the dental diploma, the first dental hospital in Soho Square was formed in 1859, and the school in 1860, and ten years later, when increased accommodation was urgently required, it was chiefly to Sir Edwin Saunders's indefatigable perseverance that a site was secured and the hospital removed from its retired and little-known position to the more advantageous site in Leicester Square. By the generosity of Sir Edwin and other friends of the hospital it started on its new career free of debt; the later additions to the building being also largely due to Sir Edwin's help. As an appropriate testimonial a sum was raised by the profession which took the form of a Saunders Scholarship.

At the second meeting in London of the British Dental Association, in 1886, Sir Edwin Saunders was President. He was elected President of the Metropolitan Counties Branch of the British Medical Association in 1881, the honor conferred by our *confrères* being much appreciated by the dental profession, and in

the same year, at the meeting in London of the International Medical Congress, Sir Edwin presided over the Dental Section.

For more than forty years Sir Edwin Saunders was Dental Surgeon to her late Majesty Queen Victoria and the late Prince Consort. Very many others of the Royal Family were also under his care. Sir Edwin possessed many tokens of her late Majesty's appreciation, and in 1883 he received the honor of knighthood.

Sir Edwin was many-sided in his tastes. He was president of the Chrysanthemum Society and also an energetic supporter of the Botanical Gardens. Many members of the profession will remember his beautiful house at Wimbledon, and its hospitality. On the occasion of his golden wedding an illuminated album, in which were inscribed the names of his professional friends, was presented to him, Lady Saunders receiving a diamond brooch at the same time.

Sir Edwin Saunders was buried at Putney Vale Cemetery, on March 20, the funeral being attended by many of his friends and admirers.—*The Dental Record*.

Current News.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE Council of the Pennsylvania State Dental Society have deemed it advisable to change the next meeting-place from Pittsburgh to Ligonier, Pa. The Committee is arranging for proper accommodations, railroad rates, etc., and anticipate one of the very largest and best meetings in the history of the Society. Programmes will be issued not later than June 15.

V. S. JONES,
Corresponding Secretary.

MASSACHUSETTS DENTAL SOCIETY.

THE thirty-seventh annual meeting of the Massachusetts Dental Society will be held in Massachusetts Institute of Technology Building (Huntington Hall), Boston, Wednesday and Thursday,

June 5 and 6, 1901. The committee have secured a goodly amount of talent, and the meeting promises to be well worth the consideration of the profession.

EDGAR O. KINSMAN,
Secretary.

CAMBRIDGE, MASS.

NEW JERSEY STATE DENTAL SOCIETY.

THE thirty-first annual session of the New Jersey State Dental Society will be held in the Auditorium, Asbury Park, N. J., commencing Wednesday, July 17, 1901, at ten A.M., and continuing in session Thursday and Friday. The Columbia, adjoining, will be the head-quarters, with rates of \$2.50 and \$3.00 per day.

To the busy practitioner who desires to witness the latest and best efforts in clinical dentistry, "Come." Fifty clinics. The best and newest efforts in the science of dentistry. Come and hear five papers read. A veritable museum of the latest and best in electrical appliances, mechanical tools, the chairs, instruments, and accessories of the modern dental office. Come and see us, and mark the days off *now*. The time will not be wasted. You will see the contents of not only one dental depot, but of all the country. The best efforts of the inventions pertaining to our profession up to date. The city dentist as well as the one from the cross-roads will see and learn something.

CHARLES A. MEEKER, D.D.S.,
Secretary.

29 FULTON STREET, NEWARK, N. J.

TENNESSEE DENTAL ASSOCIATION.

THE next meeting of the Tennessee Dental Association will be held jointly with the Southern Branch of the National Dental Association, at Nashville, Tenn., beginning Monday July 29, 1901. The profession is cordially invited to be present.

W. M. SLOCH, Memphis, Tenn.,
President.

A. SIDNEY PAGE, Columbia, Tenn.,
Secretary.

COLORADO STATE BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners for the State of Colorado will meet in Denver, June 3, 1901, at ten A.M., to examine applicants for license. In addition to the usual written and oral examination, candidates must supply their own patients, and come prepared with all necessary instruments, rubber dam, and gold, to perform practical operations under the supervision of the board, which will pass on suitable selections of cavities.

H. F. HOFFMAN,
Secretary.

611 CALIFORNIA BUILDING, DENVER, COL.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE nineteenth annual session of the National Association of Dental Examiners will be held at the Plankington Hotel, Milwaukee, Wis., Friday, August 2, 1901, commencing at ten A.M. and continuing Saturday and Monday. Arrangements are under way for those residing in the Middle and Eastern States for a reduced fare by the Lehigh Valley Railroad from New York and Philadelphia. Full particulars in the later journals.

CHARLES A. MEEKER, D.D.S.,
Secretary.

29 FULTON STREET, NEWARK, N. J.

NORTH CAROLINA STATE BOARD OF DENTAL EXAMINERS.

THE North Carolina State Board of Dental Examiners will meet in Morehead City, N. C., June 24 and 25, 1901. The examination will be written, together with practical operations in the mouth. Applicants are required to furnish materials and instruments.

R. H. JONES,
Secretary.

WINSTON, N. C.

SOUTH DAKOTA STATE DENTAL SOCIETY.

THE South Dakota State Dental Society will meet at Sioux Falls, June 11, 12, and 13.

B. S. BLUNT.

NEW ENGLAND ASSOCIATION OF DENTAL EXAMINERS.

AT the Algonquin Club, Commonwealth Avenue, Boston, on Wednesday evening, April 24, this Association assembled for its fifth annual dinner and meeting. The discussion after the dinner was upon the conduct of State boards and their mutual relations, the object of the organization being the creation of a standard examination in all the New England States, so that there can be, under suitable restrictions, an interchange of certificates. All the State boards were well represented, and the honorary members, formerly members of State boards, present were Dr. L. D. Shepard, of Boston; Dr. J. Scare Hurlburt, of Springfield; Dr. C. A. Brackett, of Newport; and Dr. A. B. Miller, formerly of the Maine board. The dean of the Dental Department of Harvard, Dr. Eugene H. Smith, and Dr. Harold Williams, dean of the Dental Department of Tufts College, were the guests of the evening.

The following were chosen officers for the ensuing year: President, Dr. Thomas J. Barrett, of Worcester, Mass.; Vice-President, Dr. Dana W. Fellows, of Portland, Me.; Recorder, Dr. George L. Parmele, of Hartford, Conn.; Chairman of the Executive Committee, Dr. John F. Dowsley, of Boston, Mass.



WILLIAM HENRY MORGAN, M.D., D.D.S.

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Original Communications.¹

THE CONDITION OF THE TEETH OF CHILDREN IN PUBLIC SCHOOLS.²

BY G. E. JOHNSON, ANDOVER, MASS.³

It is well known that with the advancement of civilization there has come an increasing tendency to physical degeneracy in many particulars. This is especially noticeable in regard to the jaws and teeth of the present generation. The teeth of Americans compared to those of contemporary savage tribes and half-civilized peoples, are seen at much disadvantage. Indeed, there has arisen a deep concern, not alone in this country, but in Europe⁴ as well, over the conditions of the teeth of the rising generation. There is no small evidence that, should present conditions continue, a large class of people in this country would become toothless at a comparatively early period in life.

The regular practitioner has not a favorable opportunity, gen-

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the American Academy of Dental Science, February 6, 1901.

³ Superintendent of Public Schools, Andover.

⁴ James Leon Williams: The Degeneration of the Human Teeth. New Review, vol. vii., 1892.

erally, for observing the condition of the teeth of all classes. To him, the actual condition of the teeth of the great mass of people is not known, except by inference, for the greater portion seldom or never consult a dentist. This is especially true in the case of children. A very great majority of even well-to-do parents do not employ a dentist for children with baby teeth, and doubtless most children would never see the inside of a dentist's office were it not for the purpose of having teeth extracted. Few dentists, therefore, are really in touch with a representative body of children. But there has been a deep interest growing among dental practitioners in this country and abroad in regard to the actual condition of the teeth of the rising generation. And the public school has offered the very best medium of all for gaining information on this matter. Here we find children of all ages, classes, and social conditions, and, we might almost say, of all nationalities, and it is not surprising that investigations of the nature of the one conducted at Andover should have been undertaken. It is rather surprising that far more extensive and earlier investigations have not been made.

In 1880 Dr. Samuel Sexton, Aural Surgeon to the New York Eye and Ear Infirmary, made a thorough examination of the teeth of eighty school children. Scarcely any of the children were free from dental irritation. "In thirty of the number," he says, "the teeth were in such an unhealthy state, from irregularities and decay, that wax impressions were taken of them; these have since been mounted up in plaster for study. The deplorable neglect of the teeth of these children was a surprise to me, although, from previous observations, I had expected to find them very bad indeed. It was notable that teachers having charge of these pupils never suspected that the teeth ever gave rise to any serious trouble, but it was ascertained by questioning the children themselves that in nearly every instance they had experienced pains in the teeth or ears, sometimes in both. The appearance of many of these children indicated that the general health had not escaped the consequences of imperfectly masticated food; that some of them also suffered from neuralgia about the head and face goes without saying."¹

An investigation of this nature has been made in Dakota and

¹ Circular of Information of the Bureau of Education, No. 5, 1881, Washington.

Illinois. Six hundred and twenty-three children were examined, and thirty per cent. of all the teeth were found to be diseased.

Mr. Denison Pedley, in England, conducted an examination of the teeth of three thousand eight hundred school children from three to sixteen years of age. Seventy-five per cent. of the children had diseased teeth. About twelve per cent. of the teeth needed filling or extraction. While this was considered very bad, it is much better than the condition of American children thus far examined.

Unghavari, an Hungarian, in Scedegin, examined one thousand children between the ages of six and twelve, and found that 87.02 per cent. had diseased teeth. Twenty-two and one-half per cent. of the baby teeth were defective, 7.75 per cent. of the permanent teeth were defective.

In Hamburg 94.4 per cent. of three hundred and thirty-five orphan children had diseased teeth.

A very extensive investigation of the teeth of school children has been made by the association of dentists in the province of Schleswig-Holstein, Prussia. Nineteen thousand seven hundred and twenty-five children in nineteen cities were examined. Ninety-five per cent. of the children from six to fifteen years of age were afflicted with caries. Only two hundred and eighteen children of the nineteen thousand and over had ever been treated by a dentist. The mouth hygiene of these children was found to be very unsatisfactory, endangering the sound teeth and proving a source of infection.¹

Dr. Karl Röse reports an investigation in the provinces of Baden and Thüringen of the condition of the teeth of school children. In the regions poor in lime, he finds, in Baden, 98.7 per cent. of the children afflicted, and 35.3 per cent. of the teeth diseased. In Thüringen ninety-eight per cent. of the children are afflicted, and 34.9 per cent. of the teeth are diseased. In regions rich in lime, he finds, in Baden, seventy-nine per cent.² of the children with diseased teeth, and 16.1 per cent. of the teeth affected; in Thüringen, 82.8 per cent. of the children with diseased teeth, and 16.7 per cent. of all the teeth diseased.

In Thüringen only twenty-seven children in six thousand three hundred and three had fillings. In Freiburg were found only fifty-

¹ *Zeitschrift für Schulgesundheitspflege*, No. 7, 1900.

² *Ibid.*, No. 2, 1895.

three teeth out of twenty-eight thousand three hundred and forty-three saved by fillings. In the higher schools was found a better condition of the teeth in respect to care. In the Freiburg Gymnasium one diseased tooth in six was found to be filled.

Dr. C. Henie, school physician in Hamar, Norway, a town of about the size of Andover, examined six hundred and sixty school children from seven to fifteen years of age, and gives some very interesting tables which will be mentioned later in connection with my own.¹

Four hundred and ninety-seven school children in Andover were examined,—two hundred and fifty-seven boys and two hundred and forty girls, from four years of age to eighteen. Ninety-six and nine-tenths per cent. of all the children were afflicted with caries. Only fifteen children, nine girls and six boys, had perfect teeth, and all but two of these were under nine years of age. Thirty-one and four-tenths per cent. of the teeth were diseased,—boys, thirty-two per cent.; girls, 30.8 per cent.; 41.7 per cent. of the temporary teeth, 26.5 per cent. of the permanent teeth.

TABLE OF DISEASED TEETH, BY AGES.

Age, years.	Per cent. diseased.	Age, years.	Per cent. diseased.
4	29	11	21
5	31	12	25
6	35	13	35
7	34	14	36
8	31	15	43
9	41	16 to 18	52
10	30		

From the above will be noticed the general increase in the percentage of decayed teeth up to ten years of age, and then the quick drop during the next two years. Children between eight and nine have about one-half of their baby teeth still in the mouth, most of which are in bad condition. At ten years of age most of the baby teeth have given place to the new permanent teeth, and at eleven years of age children enjoy the greatest immunity from diseased teeth of any period in life after the fourth year. Alas that this

¹ Zeitschrift für Schulgesundheitspflege, No. 2, 1898.

more hopeful condition does not continue! At fifteen years of age they have lost all they had gained and more.

At about six years of age appears the first permanent molar. The fate of this first-born and natural heir of the strength and hardihood of the permanent teeth, as shown in the mouths of these children, is interesting. Evidently at its coming it is much needed,

TABLE COMPARING THE TEETH OF ANDOVER CHILDREN AND THOSE
OF CHILDREN OF HAMAR, NORWAY.

Age, years.	Per cent. diseased. Andover.	Per cent. diseased. Hamar.
7	34	21.1
8	31	22.4
9	41	20
10	30	16
11	21	10.7
12	25	10.3
13	35	11
14	36	12.6
15	43	13

for most of the baby molars are now mere shells of bone, but a sad fate awaits it. Contaminated almost at once by its infected neighbors, we find this giant among the teeth diseased to the extent of one in every six, the very first year. Yet I find most eminent authority for the assertion that the sixth-year molar is naturally the strongest and most useful of all the teeth. Children between seven and eight have 40.4 per cent. of these teeth diseased; at eight, seventy per cent.; at twelve, seventy-eight per cent.; at fifteen, ninety per cent. Long before it is even suspected by many that these teeth are anything more than baby teeth, an error rudely dispelled when they come to the realization of the facts by having one pulled, very many are past help. Scott says of Zohauk, the Nubian slave, "The lord of speech has been stricken with silence betwixt the ivory walls of his palace." More fitly might the mouth of the American boy of nine or ten, with his shining new front teeth, be described as a sepulchre, white without, but within full of all uncleanness.

Dr. Mary E. Gallup, of Boston, for several years gathered statistics of the sixth-year molar in the mouths of native-born Americans. Of three thousand Americans over twenty-five years of age, only seven had all four sixth-year molars in the mouth.

TABLE SHOWING PROGRESS OF DECAY IN THE SIXTH-YEAR MOLAR.

Age, years.	No. children.	No. molars.	No. diseased.	No. lost.	Per cent. diseased or lost.	
					Andover.	Hamar.
5 to 6	36	30	4	0	13.3	...
6 to 7	32	92	14	0	15.2	...
7 to 8	27	105	47	0	40.4	18.5
8 to 9	34	136	90	2	70.2	40.9
9 to 10	51	204	143	7	73.5	50.3
10 to 11	50	200	131	17	74.0	52.8
11 to 12	56	224	132	19	67.4	49.3
12 to 13	60	240	152	37	78.7	53.3
13 to 14	51	204	131	36	81.8	55.5
14 to 15	26	104	81	16	93.2	57.5
15 to 16	15	60	41	13	90.0	60.3
16 to 18	15	60	43	13	90.0	...

Besides the decay of the teeth there were numerous abnormalities, some scarcely less serious than the disease of the teeth, either as regards appearance or health. More than one-fourth of the children examined—*i.e.*, twenty-six per cent.—had one or more of the following: Protruding upper or lower teeth, teeth pointing inward or outward, or jaws meeting at either front teeth or back teeth only, thereby interfering greatly with mastication of food. Two children were unable to bite the little finger when inserted between the front teeth. Some had teeth meeting end to end at the front of the mouth so that the molars were unable to touch those of the opposite jaw. Thirteen and one-tenth per cent. of these children had too long retained baby teeth, many of which were causing a crowding out of place of the coming second teeth. One day a little girl came to my office with a singular-appearing mouth, which, on my looking more closely, disclosed a double set of teeth across the entire front of the upper jaw, the baby set being allowed to remain unmolested in the way of the second set. All the baby teeth are normally displaced by the permanent teeth at about eleven years of age; yet we found many baby teeth in the mouths of children from twelve to fifteen years of age, and occasionally even to seventeen or eighteen years of age. Cases were not wanting of too early extracted baby teeth, and what is worse, of course, extracted by dentists.

Dr. W. H. Atkinson denounces this extraction of children's teeth as "murder," and claims that not five per cent. of children

at sixteen years of age, in consequence, have fully and regularly developed jaws; while Dr. Edwin Collins, of the *London Dentist*, says that extraction of teeth should be scarcely less rare than amputation of limbs. And yet, not many years ago, in our enlightened Commonwealth it was not an unusual thing to see some travelling “dentist” extracting teeth, even of irresponsible children, in the public street by the dozens, “free of charge,” and “without pain.”

Three-fourths of the children examined in one building had unsightly stains upon the teeth. Of the one hundred and sixty-five children examined in this building, fifty-eight had prognathous upper jaw, eight prognathous lower jaw; twenty-eight had occlusion of molars and bicuspid only, ten of molars only; one hundred and thirty-six had green stains more ¹ or less marked; forty-seven gave evidence of being mouth-breathers; twenty-two suggested the possibility of adenoids; eleven had abnormally high arches, three V-shaped arches.

The records written in these child-mouths also told us that, in the case of the great majority, it was only when afflicted with what Burns calls the “hell o’ a’ diseases,” the toothache, that the dentist was ever employed, and then as one whose function it was to tear out these organs of digestion and rid the mouth of them, rather than to save them. The three hundred and twenty-six children over nine years old had lost one hundred and eighty-three permanent teeth,—more than one to every two children. After fourteen years of age there was an average of one permanent tooth lost to each child. One girl of fifteen had lost all her first permanent molars and one twelfth-year molar, and the other three had cavities.

It was very evident that many of these children had suffered much with the toothache. Twenty-two and one-half per cent. said they had suffered a great deal during the past year, and one-half of the remainder had suffered more or less.

While the percentage of cavities filled is much better than that found in Germany, yet it is amazingly small. Less than twenty per cent. of the cavities in the permanent teeth were filled. Among high-school pupils there was a better record, 50.3 per cent. of all cavities being filled.

Each mouth bore a testimony of its own in regard to the care

¹ Dental Cosmos, vol. iv.

taken of the teeth, but each child was also questioned on this point. Only thirteen per cent. of the children under six years of age brushed their teeth or had them brushed; eighty-seven per cent. rarely or never brushed their teeth. Of the whole number of children, only one in three made any pretence of regularly caring for the teeth. One might suspect that this low percentage was due to including in the calculation the very young children. But 62.9 per cent. of children over six years of age neglected to clean the teeth, and even twenty-three per cent. of the high-school pupils examined were guilty of like neglect.

So much for the condition of the teeth of school children in Andover. To recapitulate and make clear the general condition of the teeth, before passing to the next point, let us try to get a sort of composite picture of the average school child in Andover. He has twenty-four teeth; eight of them are diseased; sixteen of them are discolored with unsightly accumulation of food and deposits, or else he has some noticeable malformation, interfering with breathing or mastication, or disfiguring his appearance; three of the four first permanent molars are seriously affected, or else one is already lost and another decayed. He has either never put a tooth-brush to his teeth, and has had toothache more or less during the past year, or he is suffering excruciating pains, and has never seen the inside of a dentist's office. Furthermore, the chances, as will be shown later, are that he has suffered from malnutrition, that he is shorter and lighter than he should be, and that his school work has been impaired. And what is sadder, his condition is growing continually worse.

As I have said before, with the advancement of civilization there has been a corresponding degeneration of the human jaw and teeth. According to Dr. Röse, only 2.5 per cent. of Eskimos have defective teeth, three to ten per cent. of Indians, three to twenty per cent. of Malays, forty per cent. of Chinese, and eighty to ninety-six per cent. of Europeans; while ninety-seven per cent. of Andover school children are thus afflicted.

I am sure we do not wish to stop the advancement of civilization, but we should like to save the teeth. Just as it is true that man in his evolution from the lowest monkey has lost twelve teeth, so it may be that the race is yet to lose more teeth. Indeed, already four of the thirty-two teeth now considered the normal number for man give much evidence that they are about tired of

appearing at all, and are ready to have their service to humanity called ended. Not to speak at length of the causes which combine against the teeth of man, we may briefly state, for the sake of what is to follow, the chief among them.

The changes in the physical structure of the body, incident to evolutionary progress; the lessening need of teeth as an initiatory organ of digestion; changes in the kind and composition of food; the general manner of living under modern social conditions, with its attending deteriorating effects; and, negatively, the fact that personal hygiene and care for the teeth have not advanced with sufficient rapidity to counteract these causes of physical degeneracy. For generations the brain has been encroaching upon the lower face and jaw. Only eight out of four hundred and two British soldiers had a width of jaw equal to the *average* of the Roman soldier, while the average American jaw is 0.37 of an inch narrower than that of the ancient Roman.¹ There is grave danger in these changes, the more because they are so imperceptibly gradual. But I do not believe that race development must be at the cost of the physical degeneracy of the individual. Modern education, modern science, medicine, and philanthropy are to triumph over these dangers and rescue the bodies of our children and of their children's children from physical wreckage. Physical health is still to remain possible in all the future changes of our race. In this work of reconstruction, in accord with the laws of health, professional and individual care of the mouth have no insignificant part to play.

There is a great need of a motive on the part of the people to care for their own teeth and the teeth of their children. There is a deplorable ignorance and inappreciation of the value of good teeth and the harm arising from their neglect. Education is the first and great need, and this may best be accomplished through efforts of dentists, directly and indirectly, with their patients, by publishing papers, in co-operation with philanthropic societies, regular physicians, school boards, and the public schools. These facts especially should be made apparent to all: that the great question of physical welfare, especially so in the case of children, is the question of nutrition; that what is digested and assimilated,

¹ E. S. Talbot: *Degeneracy: Its Causes, Signs, and Results*, Contemporary Science Series.

rather than what one has swallowed, is the principal thing; that the proper mastication of food is an important step in the digestive process; that this is very apt to be thorough, especially with children, in the exact ratio to the condition of the teeth. I asked many children, "On which side do you chew your food?" Immediately came the answers, "On this side, or this; it hurts on the other." Or, "It hurts me to chew with my back teeth. I take a mouthful of food and a swallow of water to help me swallow." How can a child properly masticate its food when one or both sides of his mouth have sensitive, "jumping" shells of teeth, instead of solid bone? Or when his incisors meet in a criss-cross so that his back teeth fall a quarter of an inch or more short of touching? Yet we are told that all degenerations result from a disturbance of nutrition at some critical period of growth. Nathan Oppenheim, in "The Development of the Child," advances strong testimony to his claim that it is nutrition that has far more to do with the mental physical welfare of the child than even heredity. We are told that mortality is greater beyond all comparison from the first to the tenth year of life; that a very large proportion of the physical ills of a lifetime are allotted to the period of childhood; that nearly if not quite one-half of these ills is due to derangement of the digestive apparatus, hence the importance of proper mastication of the food.

Again we are told that the mouth, when rendered foul through the decay of food and teeth, becomes a veritable hotbed for the lodgement and generation of disease germs, an "entrance gate" for infectious diseases. The immunity of the physician, though constantly exposed, is due far more to cleanliness of mouth and person than to anything else. By the lowering of the general tone of the physical condition, the presence of decaying teeth and unclean mouths have much to do, it is asserted by physicians, in the contraction of sickness in general. The dentist and the physician have a grand opportunity for co-operation for the good of public health.

Dr. Edwin Collins, in the *Nineteenth Century* for July, 1899, called attention to the relation of sound teeth to good scholarship. One will readily admit that ability to work well at one's studies necessitates good digestion and freedom from pain. How can a child suffering night after night with toothache do well in school? The answers of the children show that one-fourth of them during

the past year suffered a great deal from toothache. "I had the toothache so I could not sleep much nights for two weeks;" "I have had very bad toothache," are some of the statements of the children to me in private. Feeble-minded children, up to seventeen years of age, compare very favorably with normal children in the condition of the teeth, despite the obvious disadvantages of the former in caring for them.¹ The same is more strikingly true in the case of the inferior races. Many children naturally very dull have excellent teeth. We could possibly draw no inference to the effect that naturally good tooth-structure has a direct relation to high mental ability, but who can doubt that the general health and the general condition of the teeth, so far as they mutually affect each other, have an important bearing upon the school work of children?

The children examined were classified by their teachers as bright, average, or dull. Among the children with good teeth there were found thirteen bright children to every ten dull children, but among the children with poor teeth were found only eight bright children to ten dull children. It was found also that very generally the average age of children with good teeth, in any grade, was less than that of children with poor teeth for the same grade. So far as these statistics go, they seem to indicate that the chances of children with good teeth are appreciably better for scholarship and promotion than are those of children with poor teeth.

But, on the other hand, it should be stated here that a very bright child may have very poor teeth, the bad condition of the teeth being, in a considerable measure, induced by over-stimulation of the brain. There seems to be a relation between over-expenditure of nervous energy and imperfect development of the teeth. Every bright, nervous child with not very good teeth should be guarded from over-pressure in school work, especially during the years when the teeth are growing.

A normal increase in height and weight of children is perhaps the best evidence of good physical condition. Many careful measurements of thousands of school children seem to show that, taking a large number of children, there is a relation between superior

¹ Dr. Ales Hrdlicka: Report of the Managers of Syracuse State Institutions for Feeble-Minded Children, 1898.

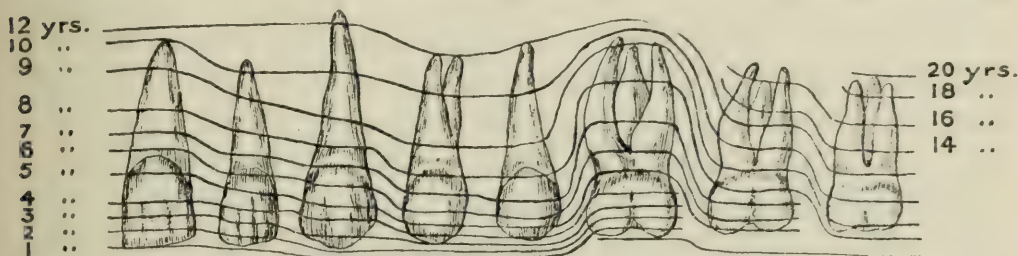
height and weight, and physical, mental, and moral superiority. I refer particularly to the measurements conducted by McDonald in Washington, Klein in Worcester, Porter in St. Louis, Christopher in Chicago, and Byer, of the United States navy. Since nutrition is the basis of development, and since the teeth have an important part to play in the process of digestion, it seemed interesting to know whether any relation could be traced between mental and physical superiority and superiority of the teeth. Owing to the comparatively small number of children who could be grouped for comparison, whatever results were found are not claimed to be perfectly reliable. I do not wish to be understood as making any broad generalization on the data gathered, but the results certainly deserve serious consideration.

The weight of boys with good teeth was compared with the weight of boys with poor teeth at each age from five to fourteen, also the weight of girls with good teeth with the weight of girls with poor teeth of corresponding ages, there being twenty groups in all. The children with good teeth surpassed children with poor teeth in weight in fifteen out of the twenty groups. Combining the average weights of boys and girls with good teeth for each age, and the weights of boys and girls with poor teeth for corresponding ages, and comparing, it was found that the children with good teeth surpassed in weight the children with poor teeth at all ages except at eight and thirteen. Combining the averages of children with good teeth for all ages and the averages of children with poor teeth for all ages, the children with good teeth surpassed the children with poor teeth in weight by an average of 2.7 pounds per child. In other words, children with good teeth were, on the average, about half a year ahead of the children with poor teeth in physical development, as shown by weight.

Parents should know, also, that the calcification of the teeth begins long before the child is born; that any disturbance of nutrition due to bad heredity or maternal impressions becomes registered upon the teeth; that the enamel-organs and dentine germs of the permanent teeth form before birth; that the first permanent molars begin to calcify before birth; that from birth to five years of age is the critical period for the calcification of the permanent teeth. It is the general notion that it is of little moment whether the baby teeth decay or not. So far as they affect the general health and condition of the mouth, the baby teeth have a

very great influence upon the permanent teeth. So far as all the permanent teeth except the wisdom-teeth are concerned, their natural fate is fixed before the child has cut his permanent front teeth.

The following diagram¹ of the teeth is instructive. The lines show what teeth and what portion of each tooth may suffer from malnutrition at certain ages. To find what teeth and what portions may suffer at three years of age, for example, follow along



the three-year line. It will be seen that the central and lateral incisors will suffer just below the middle of the enamelled part, the cuspid at the end, and the sixth-year molar.

In spite of the fact that the early years and the care of the temporary teeth are so important, it was very rare to find that the temporary teeth had been particularly cared for. Of the eighteen hundred and forty cavities in the baby teeth, only forty-eight had been filled,—*i.e.*, 2.6 in each hundred. Very few of the children under six years of age brushed their teeth or had them brushed. There is no reason why children of three or four years of age may not brush their own teeth, even so acquire the habit that they will feel uncomfortable when their teeth are not clean.

Dr. W. D. Miller, of Berlin, has shown that there is a micro-organism concerned in the decay of the teeth. These microbes, infectious in character, lodge upon some hollow or unclean portion of the tooth. They secrete an acid which dissolves the enamel of the tooth, and they burrow gradually deeper and deeper into the tooth. It is supposed that these microbes do not live upon the tooth-substance, but upon the sugar and starchy foods which have been acted upon by the saliva of the mouth, while the acid secreted caused the crumbling away of the tooth. Hence the importance of keeping the teeth perfectly clean. A tooth that is smooth and perfectly clean can scarcely decay.

¹ Reproduced from *Degeneracy: Its Causes, Signs, and Results*, E. S. Talbot, Contemporary Science Series.

Parents should know of the effect of different foods upon the teeth. Unlike other portions of the body, after the enamel has once been formed there is no cell for nourishing or repairing the enamel. Whatever effect the food is to have upon the formation of enamel of the teeth must take place before a certain age. In the case of infants, next to mother's milk, cow's milk diluted with barley-water is the best food for the teeth. When the child is old enough, the teeth may be well nourished by means of rolled oats, rolled wheat, graham, meat, fish, eggs, and fruits. The natural order of food for man, according to Dr. Röse, is the following: Flesh, whole grains, vegetables, bread, cooked meat, butter, fat. Races which live largely upon flesh are least afflicted with caries.

Children should not be fed largely upon soft and sloppy foods. The strong exercise of the teeth in mastication seems to be the natural and necessary accompaniment of sound teeth. Children should have something to chew upon. It is significant that an examination by Dr. W. Smith of the Sioux Indians in Buffalo Bill's Wild West Show disclosed the fact that they were entirely free from caries of the molars and premolars, but that the molars were worn.¹ The same was found to be true in the case of the teeth of the Egyptian skulls brought to England by Dr. Petrie. Dr. Smith claims that the grinding surfaces of sound molars are worn, but diseased molars are not worn, and that this fact is strong testimony to the necessity of vigorous exercise of the teeth in maintaining a healthy condition.

Even the degree of the hardness of the water is of importance. I am aware that the influence of the drinking-water upon the teeth is considered of no importance by some authorities, but it is a fact worth notice that in the extensive investigation in Germany there appeared a wide margin in favor of the teeth of children in regions rich in lime: two thousand nine hundred and seventy-three children examined in a region poor in lime showed that 34.9 per cent. of all teeth were diseased; an examination of two thousand seven hundred and eight children in a region rich in lime showed that only 16.7 per cent. of the teeth were diseased. It is interesting to note that the degree of the hardness of the water in the region most afflicted with caries was 0.5; in the region of better teeth, 8 to 12. The degree of the hardness of water in Andover is

¹ *Journal of Anthropological Institute*, vol. xlv., p. 446.

from 1.3 to 1.7. The percentage of diseased teeth among Andover school children is 31.4, which corresponds very nearly to the result of the German investigation for districts of equally soft water.

The part that the teeth have to play in personal appearance is by no means unimportant. A beautiful set of teeth adds very much to a face otherwise attractive, but no face can be said to be attractive which is disfigured by a poorly kept and irregular set of teeth. Malformation of the mouth and teeth may cause undue self-consciousness and diffidence on the part of the possessor, even a moroseness of disposition, which greatly hinders his happiness and success in life. By a sort of intuition which we could scarcely rid ourselves of if we would, we are compelled to discount people with deformities. It is a great pity that parents should allow a child to bear the extra burden, in his search for success and happiness, of deformity in any degree that is within their power to have remedied. A careful dentist tells me that about ninety per cent. of the various deformities found in the Andover children may be remedied wholly or in a great measure if undertaken in due season.

That the decay of the teeth may cause deafness is well understood by aural surgeons. Dr. Samuel Sexton, before quoted, says, "I have long been in the habit of examining the teeth of children brought to me with aural diseases, and it happens very often that unsuspected dental irritation is found to coexist to which the aural irritation is in some measure attributable. Among the large number of school children who attend the aural clinics at the infirmary it is rare to find one where dental irritation should not be considered as a causative factor."

It seems to me that the dentist has a responsibility in this condition of the teeth of school children. His part is more than to receive children in his office, do his work honestly and well, and collect his fees. With the dentist rests naturally the burden of the general enlightenment of the public. Whose fault is it that the great majority of parents, even those fairly well educated, never dream that their children have any permanent teeth until they see the incisors coming, much less that their child of eight has had four permanent molars for two years, and that two or even three of the four are already diseased? "Mamma knows about that tooth," said a little girl to me, when I called attention to a cavity in one of her first permanent molars, "but she is not going

to have it filled, because it is a baby tooth." The record of these first molars shows that this mother, apparently more thoughtful than most of them, because she did intend to have the permanent teeth filled, was only one of a great majority who believe that the sixth-year molar is a baby tooth.

No one dentist may perhaps take upon himself, for obvious reasons, the enlightenment of the public in regard to the care of the teeth, especially so far as it concerns his profession, but an association of dentists, in any community, may and ought to do so. There are many ways by which this might be done, it seems to me, in a town like Andover: timely articles in the local paper on the teeth and their care, by the members of the association; co-operation with the regular physicians. Mothers' meetings are common now even in small towns,—a timely talk to mothers on the care of the teeth of infants and young children would be gratefully received, I am sure. The association should know what instruction is given in the public schools in regard to the teeth, what text-books are used, what charts, etc. Superintendents, I believe, would welcome any suggestions from dentists in this matter. Every town has its characteristic local conditions. Perhaps a manual for the use of the schools could be prepared, which would be far superior to the treatment in any text-book that could be purchased for that town. In some of the more progressive towns, dental inspection of school children might be established through the efforts of the local dentists. This must come in time. The day is approaching when every child in our public schools will be considered as a being with a body as well as with a mind. With the burden of public enlightenment comes to the dentist also the responsibility of the policy or lack of policy of public officials in this matter, so far as it concerns public institutions, especially the public schools. If this responsibility rests not on the dentist, then on whom? And here comes up the question of the poor. Dr. Richard C. Newton, in the *Dental Cosmos* for May, 1896, says, "The dentists, if they wish to be esteemed by the public generally as specialists of medicine, must give of their time and skill to treating the poor. It is the willingness to give thought, time, and skill to the service of the poor which has elevated and ennobled the profession of medicine. It is this that has made it the most generally beloved and respected of all the professions." How widely the free clinics for the poor have been established and how

greatly abused I do not know, but there are still many deserving children without them. As one result of this work in the Andover schools, there will be established, mainly through the generosity and philanthropic spirit of our local dentists, a dental room, open at least three forenoons a month, to the service of the children of the poor.

I desire, in closing, to acknowledge my great indebtedness to the dentists of Andover, Drs. Gilbert, Hulme, and MacIntosh, for their very generous assistance and helpful suggestions. Without many hours of hard work on their part so freely given, this investigation could hardly have been conducted. I am indebted, also, to Dr. William H. Burnham and Librarian Louis N. Wilson, of Clark University, for suggestions and aid in securing literature on the subject.

TIN: A PLEA FOR MORE CONSERVATIVE METHODS IN FILLING TEETH.¹

BY T. D. SHUMWAY, PLYMOUTH, MASS.

IN submitting this subject for your consideration we wish to disclaim any intent to show superior manipulative ability in the use of cohesive gold, or to merely demonstrate by a novel experiment the possibility of uniting gold with tin by simple contact. If this were the only reason for appearing before you, it would be well not to consume valuable time which could be more pleasantly and profitably employed. I trust, in this Society, the day is gone by when exhibitions of this character continue to excite either wonder or admiration. That there have been demonstrations of this sort far beyond the mechanical skill of your essayist to excel, or even to emulate, no one is more willing to concede.

It is for the purpose of presenting the hackneyed subject of filling teeth in a somewhat different manner from that in which it is usually treated that the above title was selected and these specimens of the work submitted for your inspection. These specimens

¹ Read before the Harvard Odontological Society, December 27, 1900. Copyright, 1901.

are not intended to be like those made with cohesive gold and the mallet. In their physical construction they are radically different. Whatever value they possess consists in this fact.

Had the use of cohesive gold and the mallet met the expectations of the profession, it would be presumptuous, indeed, to attempt to offer anything in its place. It is true, the skill displayed in the repair of wasted and broken tissue, by contouring, has been something remarkable. Manual dexterity has reached a high state of development, but the results obtained have been at a fearful sacrifice of tooth-structure. History repeats itself, and the same objections which caused the failure of crystal or sponge gold, nearly fifty years ago, applies to any form of cohesive gold when placed in contact with tooth-substance by mallet force. In the discussions relating to the use of crystal or sponge gold, it was pointed out what would follow this plain violation of natural law, in impaired or arrested function. In an article by Dr. J. De Haven White, published in the *Dental News Letter* of July, 1854, the writer says, "It is believed by some that a plug must be impervious to dampness; this cannot be, or, if it were, it would not be necessarily a perfect plug; dampness must permeate a plug to some extent, or the dampness will force around the plug and displace it sooner or later. We know well that a distinguished operator in our city loses more hard plugs than soft ones on that account; his plugs are therefore better than the teeth he puts them in. We do not wish to be understood as advocating hard plugs, but we believe the most perfect plug is of about equal porosity to the dentine; with a good cavity it will remain in longer than a harder plug, especially in the lateral portion of the teeth. A foil plug will not be broken up by such permeability, and a sponge plug will. No reasonably good operator loses a plug by softening, but by the margins of his cavity giving way. The constant expansion and contraction of the plug and the tooth will cause any plug to give way sooner or later, and, until we get a substance that will expand and contract with the tooth, so as not to loosen its margins, we will have some of our highest specimens of art crumbling away under our eyes."

It is evident that Dr. White had an intelligent understanding of structure and function. As a student of vital energy he was able to discern the cause of failure in the use of crystal or sponge gold. Manipulating cohesive gold by the more modern methods

does not remove the objections which he so forcibly stated. The introduction of the rubber dam made possible operations which before were only partially successful, but the evil was augmented in a more thorough crystallization of the gold by mallet force.

That many teeth have been filled with cohesive gold and the mallet which have remained for a great number of years, no one will attempt to deny. There are many people that have survived and enjoyed a comfortable degree of health who have violated the laws of correct living. There is a wonderful recuperative energy in the human organism. But for this it is a question if the race would not long since have become extinct by reason of transgression of natural law. Admitting that some teeth which have been filled with cohesive gold and the mallet are doing good service, we believe this is due to the recuperative energy that was able to overcome the contact of a foreign body incompatible with tooth-structure, rather than the influence of the filling itself. With the record of failure, it is fair to say the success of filling teeth with cohesive gold has not been commensurate with the amount of labor bestowed, the physical exhaustion, mental strain, and nervous tension on the part of the operator, together with the pain and suffering the patient has been made to endure. It is significant that crowns and bridges and inlays should follow so closely in the track of cohesive gold and the mallet. It is also significant that those who became the most expert in using gold in this form were early in the field to adopt the later method of cutting off crowns.

When the mallet was introduced for the purpose of condensing cohesive gold, it was assumed that, because lost tissue could be restored, the teeth would be preserved by purely mechanical means. Operative dentistry, or the care of the natural teeth, like the practice of medicine, is not an exact science, although it has to deal with scientific subjects. Nature rebels at any attempt to reduce her methods to exact mathematical lines. This is clearly demonstrated by a study of structure and function in tooth development. This study has to be prosecuted under difficulty, for no one is privileged to see the secret workings of nature. The microscope can only reveal what has taken place, but not what is going on in this workshop. If we could examine, under the lens, without first destroying the vital force, what secrets would be unfolded! It is by reasoning from what we know, that we are able to reach conclusions which are to guide us.

In the discussion of this subject the first inquiry, then, is, How is a tooth developed, and what are the changes wrought in this wonderful organ from its beginning to old age? or, in other words, How is a tooth builded? At its inception there is the dental arch, in which appears a groove, and across this groove, which divides it into pockets, there shoots a thin porous bone. In the pockets are follicles, which are the germs or buds of the future teeth. These follicles are connected with the circulatory system by arteries from the internal maxillary branch of the external carotid, and veins from the internal maxillary vein, which returns the blood, and terminates in the external jugular, and nerves from the fifth cerebral or fifth pair. Here we see that every pulsation of the heart sends forth the material for tooth formation. Embryologists tell us that at the end of the fifth or the beginning of the sixth month of foetal life the process of enamel formation is about to commence. The cells which form the external epithelium, or Nasmyth's membrane, have performed their function and disappeared. This membrane has a polished surface, and is a covering for the prisms or rods which are to form underneath. These prisms or rods are held together by what is termed a cementing plasm.

In the formation of enamel is first seen the form of the future tooth in a cutting edge for an incisor and a cusp for a bicuspid or molar. The enamel-organ when completed is a purely crystalline formation, and, according to the best authorities, is without any trace of organic matter. All crystalline bodies are formed from without inward, and enamel formations can be no exception to this rule. A little reflection will make this apparent. Take, for example, the shell of a lobster or the skin of a snake. When a lobster sheds its shell, it is provided with a membrane similar to the outside covering of enamel of the teeth, which is highly polished, but extremely tough and flexible. In the process of time there is formed underneath and attached to this membrane a calcareous deposit, crystalline in character, varying in thickness from one-sixteenth to one-fourth of an inch. We can readily see how impossible it would be for the lobster to shed its shell but for this crystalline process taking place from without in. Nature provided an inorganic covering which acts as a protection during the process of calcareous formation. Suppose the process to be reversed. It would simply mean the death of the lobster. After the new shell is formed, another membrane appears, and in due time

the old shell is thrown off, and the lobster comes forth increased in size. In no other way could the lobster get out of its environment and expand and grow.

What a beautiful sight is a black-snake that has just shed its skin,—so black and glossy! Now, this new skin is pure crystal, and is formed in the same manner as the lobster's shell, only differentiated to meet the habitat of the snake. Nature had to provide an inorganic covering to prevent the snake from being torn and bruised by the stones and bushes over and through which it crawls.

On a cold winter's day watch the process of crystallization on the window-pane. It is always from the sides towards the centre, and never from the centre outward. This is the key that opens the secret chamber of nature and reveals the process of enamel formation for the teeth. When once formed, the enamel plays no part in the life of the organ, any more than the lobster's shell or the snake's skin, except to act as a protecting covering. The enamel of a tooth is the only part of the animal economy which does not undergo decomposition or change. Professor R. R. Andrews, in a paper read before the recent International Dental Congress, says, "The finest lenses do not reveal the slightest differences between enamel ground from a living tooth and that which has laid in the ground for centuries."

The growth of the dentine is by a process the reverse of that by which the enamel is formed; that is, its growth is from within out. Unlike enamel, it is composed of two distinct parts, minute tubes and a fibrous tissue called the uniting medium. In their arrangement these tubes radiate from a centre. Tomes says, "The centre of radiation is the pulp-cavity." These tubes ramify in undulations not only towards the enamel, but also dip downward to form the root of the tooth. They also extend through the sides of the root, and are lost in the cementum.

This fact should have an important bearing in the treatment of pulpless teeth. As yet, we have only the framework of a tooth. It is like a house under the process of construction, with an outside covering and partition walls. In the work of tooth-building these tubes perform a very important function. They are filled with a substance that is given off from the pulp, which, so far as the microscope can determine, is amorphous or structureless. This amorphous substance, granular in character, changes into a lime-salt. This change is going on from the time the tooth is formed

until the period of extreme old age, when the pulp almost entirely disappears. There is no part of the human organism where the process of change is carried on more continuously than that which takes place within the teeth. Although the teeth are provided with an indestructible covering, they are victims of disease.

From some cause, which it is not necessary to inquire into in this connection, the enamel becomes abraded, and the dentine is attacked with caries. Nature has provided for attacks of this kind by making the point where the amorphous substance is changing into a lime-salt the most sensitive part of the organ. She at once sets up the work of repair by a secondary deposit of dentine. The sensation of pain which is experienced is not only a note of warning, but a cry for help. This cry is for a protecting covering. If the waste is greater than the repair, it means destruction of the organ. The more recent investigations have shown that the work of repair goes on even after the pulp has become inflamed.

In the *Dental Cosmos* for November is published a paper read before the International Congress at Paris, by Dr. A. Hopewell Smith, of London, on "Certain Adventitious Dentine associated with Inflammatory Conditions of the Dental Pulp," in which he says that "in the majority of the inflammations, but by no means in every inflammatory condition of the dental pulp, there is found a protecting layer of hard adventitious dentine, which is put in the place of danger; that is to say, opposite the breach by caries of the surface."

Here we see the effort of nature to protect herself even after the struggle has become hopeless. From this it would seem that operations upon the teeth, to stay the inroads of caries, should be protective and remedial. The dentist cannot save teeth any more than the practitioner of medicine can cure disease. Nature must work the cure. The aim of operative dentistry should be, primarily, to assist nature, not a display of mechanical skill, in disregard to fundamental law.

A study of the material to place in contact with tooth-substance is the first requisite, if we would approach the operation scientifically. A crystalline formation is obstructive when placed in contact with a living or fibrous body. No one would expect to ripen apples by filling them with gravel stones. If you should shoot malleted fillings of cohesive gold into the body, you would

invite blood-poisoning. The same law governs in the more dense substance of the dentine, which is filled with life. Again, it should not be anchored with dovetails, angles, retaining-pits, etc., as nature is above mathematics, and refuses to be bound. This is the reason that Dr. White says "the filling should expand and contract with the tooth," to meet the changing conditions. An amorphous substance which is undergoing a metamorphosis demands that the material to be placed in contact with it shall be as structureless as the substance itself.

An illustration of this is seen in the way lead or tin becomes encysted when buried in the soft tissue. Of all the materials that have been employed as a tooth-stopping, there are none which have shown such preservative properties as tin. It has a history and a record as old as operative dentistry. In 1825 Mr. Sigmond, of Bath, England, said, "In 1783 I stopped a considerable decay in a large double under tooth, on the outside of the crown, or near the gums, with fine tin-foil, which lasted for a good number of years."

The saving properties which tin exhibits when placed in a carious tooth are well established. The testimony of many skilful dentists bears witness to this fact. The reasons that have been given as to why tin exhibits this property have been numerous and varied. Some have attributed it to a therapeutic property in the metal; others, like Dr. Palmer, of Syracuse, that it is positive to electrochemical action, and some, like Dr. Miller, of Berlin, that it is germicidal. When compared with other metals, tin may be said to be almost amorphous. Its specific gravity is 729; it melts at 442° F.,—a little more than twice the boiling-point of water. Gold is more than four times as tenacious, and six times as good a conductor of heat. Under the same conditions, tin expands nearly twice as much as gold, but the rate of expansion of gold is nearly twice as much as tin. Here is a metal that, in its physical characteristics, borders upon the structureless. When tin is placed in contact with the amorphous substance of the dentinal tubuli, it acts as an assistant in the effort of nature to protect herself from untoward external conditions. This, it would seem, is the more scientific reason for its benign influence.

The limitations of tin have been the barrier to its general use. These limitations are its color, softness, and the tendency to what is termed oxidation. Various methods have been suggested to

meet these objections, one of them being to make a cylinder of tin and gold-foil, and then force this into place, either by the wedging process or by the mallet. But this method has only been partially successful. Incorporating gold with the tin destroyed the attractive appearance of the gold, and the tin would oxidize and wash out where it came to the surface.

The idea of covering tin with gold is not new. It was practised nearly fifty years ago. The method was to force the gold into a base of tin with a sharp instrument, with the object to simply cheapen the operation. This was the only value the author claimed for this method. In the *Dental News Letter* of January, 1856, in a communication by Dr. F. Y. Clark, on "Material used in filling Teeth," the writer says, "Now, as gold is too costly, and tin is too soft, what are we to do with those poor patients that are continually seeking our aid? The plan that I adopted two or three years ago I find as yet works well. At first I had many misgivings on account of two metals being placed in contact in the same tooth, but I can see no difference in placing two metals in contact in a tooth than in placing them in contact around it. But I think the evil is more imaginary than real, for so far I have not been able to detect the least trouble. Therefore, when I have a patient who is not able to pay me the worth of the gold used (I speak of teeth with large cavities on their grinding surface), I commence with tin and fill up the fangs (if I have removed the nerve), also the pulp-cavity, and as much of the crown as I safely can. I pack the tin in perfectly hard, leaving or making it flush, and then, with annealed number four gold-foil, I finish off. I use number four because I find it can be forced into the little threads in the walls of the cavity better than any other number when annealed. Now, I cannot see why such a filling is not just as good as if it were all gold. The tin cannot wear nor corrode, for it has not the slightest chance, and the gold on the surface is hard enough to resist all antagonists of the mouth; and, as the cost is not more than one-third as much as it would be if it were all gold, we can get pay for the gold, if not for our work. I always adopt this plan when I have to fill a tooth on the grinding surface, from which I have taken the nerve, for less than six dollars. In the incisor teeth tin, or any other metal but gold, should not, of course, be used. All cavities that can be filled with tin can be filled equally well with gold; therefore, we have no inducement to use tin but its cheapness."

It evidently did not occur to Dr. Clark that he might possibly be giving a better service, for smaller compensation, to his poorer than to his more fortunate patient who was able to pay for all gold. The method he used was solely for the purpose of economy. The idea that a filling must be in harmony with its environment, and not obstruct, but aid, nature in her work of repair, formed no part of his method, as the object was to get something cheap.

The value of a filling depends upon its ability to save teeth, without regard to the cost of the material used. The only other consideration is that it shall offend the eye as little as possible. If the theory that tin exercises a benign or healing influence when placed in a carious tooth be sound, the problem is how to eliminate its objectionable features and extend the boundary of its usefulness. A cavity filled with tin, with an outside or protecting covering of cohesive gold, laminated, so as not to incorporate the gold in the tin, is in correspondence with nature, and more fully meets the demand of its surroundings.

Much that has been said in condemnation of tin as a filling-material is proved, on examination, to be without good reason. That tin-foil, when made from the pure metal, disintegrates, or becomes powdery, is shown to be false. It is a mistake to charge tin with making the teeth black, when, really, it makes them of a brighter hue. Remove a tin filling after it has been in the cavity of a tooth for years, and the dentine will present a bright, healthy, dense appearance. Tin never penetrates the tubuli like amalgam.

But it may be urged that all this sheds no light upon the most important part of this subject,—*i.e.*, the practical application, or how to fill the teeth with tin so as to remove the objections and retain its virtues. In the filling of teeth the first step is the preparation of the cavity, and in the use of tin there are no exceptions to the general principles laid down in the various text-books. Unsupported walls of enamel are to be broken down and the decayed dentine removed. In doing this, however, no more tooth-structure need be sacrificed than is necessary to accomplish the result. Being interdigitous, it spreads laterally, and does not need angles, dovetails, undercuts, or retaining-pits to hold it in place. It is not refractory, like cohesive gold, which only stays when it is anchored, so that it cannot get away, but yields readily to pressure. It remains in place not from necessity, but from choice. The removal of healthy tooth-structure for retention is not required. It does

not call for "extension for prevention," as tin itself prevents extension. By reason of this saving of tooth-structure many fillings may be almost entirely concealed.

Tin is introduced and manipulated in the same manner as has been so often described in making cylinder fillings by the wedging process. It should be condensed into a solid mass, so that it may be cut with a sharp chisel or excavator. This is best accomplished by heating the plugger in an alcohol or gas flame to a degree to render the tin malleable. This requires about 212° F. The sensation of heat which the patient experiences is not so acute as that which follows the introduction of hot gutta-percha, provided it is done with judgment and care. When the tin is consolidated, it should be flush with the enamel walls. So far the work is done with the old-fashioned hand-pluggers with large handles. The next step is to bring the flattened surface of a very light and extremely cohesive gold cylinder in contact with the surface of the tin, when a union of the metals takes place at an insensible distance, like the uniting of two drops of water. Continue this process until there is an outside covering of gold, which will finish down to a smooth and polished surface. For finishing, all that are required are sand-paper, cuttle-fish disks, and strips. It does not need to be burnished, as burnishing tends to impair the union of the metals by drawing the gold away from the margins.

All crystalline bodies under force or pressure assume a definite form. The crystals of gold being spheroidal, the tendency under pressure is always towards the centre. The same law which governs in the vital organ should be recognized in the treatment of pulpless teeth. It is a misnomer to call a pulpless tooth a "dead tooth." It is true that the process of tooth-building is stopped with the death of the pulp, but as the tubuli extend through the sides of the root, a certain amount of vitality may be maintained under proper treatment. This treatment should be in a way to cause as little change as possible in the conditions under which the tooth was found.

There can be no question that tin in the root-canal is as bland as it would be if encysted in the muscular tissue. Clinical experience has demonstrated that a root properly filled with tin will remain perfectly odorless, while one filled in the same manner with cotton and cement, or gutta-percha, almost invariably gives off a most offensive odor on being removed. This odor is of the

kind called "brassy," and is, no doubt, largely due to a decomposition of the amorphous substance which has been arrested in its metamorphosis. A similar odor is often detected on removing a cohesive gold filling placed in a living tooth, which had been inserted with great care.

The question which naturally suggests itself is, Will a filling of this kind stand the test of crushing stress equal to those of cohesive gold or amalgam? Dr. White says "the best filling is one of about equal porosity with the dentine." Hardness, or the power to resist force when applied out of the mouth is not a scientific way of testing the value of a filling when placed in a tooth, as the conditions are in no way similar. As before stated, the object is to obtain a filling that in its physical construction shall as nearly as possible conform to the healthy organ. The teeth are not set in the sockets the same as a post is put in the ground. They are cushioned in the jaw, and give way under pressure. Besides, the material of which they are made is the most elastic of any known substance. For this reason, billiard balls are always made of ivory.

There have been many teeth filled with tin on the grinding surface that have worn out in the centre, and yet protected the walls of the cavity sufficiently to permit nature to make a secondary deposit, almost as dense and hard as the enamel with which it was originally covered. A secondary deposit of dentine, under a malleted cohesive gold filling would be rare, indeed. How often do we see teeth crumble away while these fillings remain intact. It is more scientific to have the fillings wear and save the teeth than to have the fillings remain and the teeth decay. In one case, the filling may be easily replaced; in the other the organ is lost, while the work remains.

This is not intended to cast any doubt upon the ability of the fillings we suggest of withstanding the force of ordinary attrition when placed in any part of the mouth which has been affected with caries. A practical application of this method in many different positions has convinced your essayist of the correctness of the principle that correspondence and harmony, and not "crushing stress," are the true factors in tooth preservation.

The points we have endeavored to enforce are, first, that the enamel of a tooth, being formed from without in, plays no part in tooth development or preservation, except to act as a protecting

covering; that the process of tooth-building is from within out, and continues from infancy to old age; that nature attempts to protect herself from the encroachment of disease by a deposit of secondary or adventitious dentine; that if the cause of decay is external, the recuperative force is from within; that the operation of filling teeth should be based upon a recognition of these processes of nature, and that the material when placed in contact with the dentine should be in correspondence with the amorphous or structureless substance with which the tubes are filled; that of all the materials which have been employed, tin most nearly meets these conditions; that the objections to tin of color, softness, and a tendency to oxidation are met by proper manipulation, and the field of its usefulness extended; that it suggests a theory of practice scientifically correct.

If these conclusions are well founded, it removes from the operation of filling teeth the empirical and the doubtful, and inspires the patient with confidence and hope. Being in harmony with natural law, it lifts a burden from the shoulders of the practitioner, and makes a pleasant duty of an irksome task. Having a scientific basis for its foundation, it elevates the standard of dentistry and lends dignity to a worthy calling. Above all, it mitigates the pain and suffering attendant upon operations in the mouth, from which even the most heroic shrink. If we succeed in dispelling the doubt of its practical utility from a single mind, our labor will not be in vain.

At least, it is not unreasonable to expect that in the presentation to this Society of a subject so important, both to dentist and to patient, it will stimulate discussion and evoke criticism. To this field we invite you, as no one mind can be the repository of all knowledge.

ADDRESS OF THE CHAIRMAN OF THE SECTION ON
STOMATOLOGY OF THE AMERICAN MEDICAL ASSO-
CIATION, ST. PAUL, MINN., JUNE, 1901.¹

BY R. R. ANDREWS, A.M., D.D.S.

IN reviewing some of the more important matters which have been presented to our profession during the past year, it seems to me that the symposium on Dental Education presented before this Section at its meeting is one of considerable importance as an educational factor. The time was ripe for such a discussion, and we are already beginning to see its good results. At the beginning of this twentieth century we find that advanced conditions call for a higher educational and professional standard. Some of our schools are already recognizing this, and have decided that another year should be added to their course of study, making it one of four years, and they also have under consideration the requirement of a degree in letters, or its equivalent, for entrance to their schools. Necessity for such action arises from the fact that this is an age of progression; the material development and enterprise of the time is irresistible. The man who would succeed in a profession must now grasp every legitimate opportunity. His equipment should be larger and his education broader than formerly. Success in the future is to come to him who shall be educated to do a thing as well as it is possible to do it; that is, he must become a specialist in some department of his chosen profession. I have been informed that President Eliot, of Harvard University, after reading the symposium on Dental Education, writes to our secretary that he is favorable to the establishment of a Medical University, where all the medical specialties, including dentistry, shall be taught under one head and a common degree be given to all. President Capen, of Tufts College, writes, me, under date of February 21, 1901: "I have received your pamphlet, containing an account of the proceedings of the Section on Stomatology of the American Medical Association. I have not only read your own paper with great interest and profit, but have examined the other papers sufficiently to get the drift of the sentiment of the Association. I was sur-

¹ Abstract prepared from official report.

prised to find it so strongly in accord with my own views. I may add that I find now, both in our medical and dental faculties, an opinion strongly favoring a four years' course for dental students as well as medical students, and the common degree of M.D. for all.

Some of the criticisms against this common degree come from eminent professors in our special schools, who are earnest, able, and conscientious men, sincerely believing that if we are to educate our students in medicine, they will become theorists, as are most of the educated dentists from the schools of Europe, and that the practical technical training, which in the past has made the name of the American dentist honored all over the world, will no longer be acquired; that under this new system American dentists will become thinkers rather than operators, scientists rather than practical men.

Such opinions are to be respected, but, on the other hand, the four years' course could be systematically arranged to give technical training fully equal to that given to-day in our best special schools, together with the necessary medical education that shall warrant the common degree. We should demand the same medical education that is required in other medical specialties, with all, or more, of the practical training that shall teach the hand as well as the head.

Another subject nearly as important is in relation to the many problems now before our profession, and as to the best methods of solving them. This has recently been considered by the Dental Society of the State of New York, and should receive our cordial co-operation. In considering these problems, will it be wisest to have the individual investigator proceed in his own way, paying his own expenses in solving our problems, or will it be better for national or State societies to establish commissions, whose duty shall be to oversee and encourage research work, propose problems to be worked out, and also have it in their power to furnish the necessary funds for carrying out this work? If such a commission were established, is it not reasonable to suppose that the profession would be greatly benefited and result in a more uniform practice? Such a commission should be composed not merely of eminent practitioners, but of men of judicial minds and training, whose duty should be to collect the facts, weigh the evidence, and give rulings on disputed points.

Among the students in our special schools there are always to be found a few who have the inborn faculty of investigation.

While building up a practice they give a very considerable amount of time in solving some of the scientific problems which appeal to them. Some of these men become well known to the profession, others do not. There is a very considerable expense attending many of these investigations, and research work would be better done if they could afford suitable apparatus. Work of this nature is of value to the whole profession, and it seems as though it would be wise to establish the commission suggested. Investigators could then devote a certain portion of time to solving problems and receiving therefore adequate compensation. Our schools also should encourage research work, and a department for it should be established where men who are capable should be given the opportunity to work along lines congenial to them. This may lead to a career of much value to themselves and of great good to their profession.

There are one or two important matters which I think it would be wise to consider in regard to the subject of State Boards of Dental Examiners, which is to be presented in a series of papers for our consideration and discussion at this session. This subject is an important one and will, I am sure, receive careful attention in broad and generous criticism. We are all mindful of the fact that in many of the States the board of dental examiners has been largely instrumental in raising the professional standard and in influencing in no small degree the necessity for a higher educational qualification in our special schools. With all this, there is yet something to be desired. An appointment to the board should never be a political gift. The nomination of suitable persons to fill vacancies on such a board should be made to the appointing power by nominating committees from the State societies, elected for this purpose. This plan works admirably in Massachusetts. A standard should be established by the National Board of Dental Registration for the boards of the different States, that shall make it possible for a person who has once passed a successful examination to practise his profession in any other State without further examination. And again, in justice to the older members of our profession, discretionary powers should be given the boards of the several States to guide them in granting certificates to those who have for years been active in honorable practice and who are not, by reason of advancing years, fitted to pass the same examination as should be demanded of recent graduates.

In the department of Prophylaxis the future is bright with possibilities. Recent investigation is opening up a field that gives promise soon of successful treatment. J. Leon Williams, in his brilliant paper on "The Bacteria of the Human Mouth," has demonstrated beyond a doubt that there exists upon the teeth of persons predisposed to caries a hardened gelatinous film, which is a culture medium for the growth of myriads of micro-organisms. This film he calls the "gelatinous microbic plaque." The organisms found here are largely the *leptothrix racemosis*, together with the *leptothrix buccalis*. The *leptothrix racemosis* is, like the *leptothrix buccalis*, a threadlike form, but differs in having myriads of spores growing from an extremity, where they multiply with marvellous rapidity. They are benign or malignant according to their environment, and the saliva in an abnormal condition is the exciting cause of dental caries.

Professor J. P. Michaels, of Paris, who has given the results of his recent brilliant investigations of human saliva at the International Dental Congress, tells us that, as a result of over-activity of the liver, a superabundance of glycogen may be found in the saliva, giving it an alkaline reaction; but coming in contact with the ptyalin which is always present in the saliva, a reduction occurs of the glycogen, first to glucose and then to lactic acid, which unites with the lime of the tooth. He has experimented with ptyalin and glycogen (either alone giving a neutral solution), and put them in separate bottles containing distilled water, then connected the liquids in the two bottles with a piece of cord, which formed a loop around and in contact with a chalk crayon. By capillarity the liquids came together at the chalk, which was dissolved away wherever touched by the cord. He asks, "Does not this tend to show how decay of the teeth may occur in an alkaline saliva and independent of microbic influences?"

Michaels has also shown that exciting and pathological conditions can be found and are positively recognizable in the saliva. He has been able to determine the histochemical condition of saliva of those who are not affected with carious teeth, and suggests that nutrition may establish vital conditions so desirable in securing immunity from decay.

A paper of special interest on treatment to prevent the decay of the teeth has been presented by Dr. D. D. Smith, of Philadelphia, and should command our serious attention when con-

sidered from the stand-point of recent investigation. The simple method is to place in a suitable carrier a piece of orange-wood sharpened to a chisel-point for using on the flat surfaces of the teeth, and another sharpened to a pencil-point to be used between them. These points are to be renewed as often as they become frayed. Before using they are dipped in water, and then pumice, and with them the surfaces of the teeth are polished up into the festooning of the gum, using enough force to stimulate, and cleansing what may appear to be clean teeth, going over all surfaces thoroughly, outside, inside, between, and on the occlusal surfaces. This work should be done as thoroughly as it is possible to do it, leaving the teeth in a polished and smooth condition. Such action has a stimulating influence, and under this stimulation the internal vital function seems aroused to new activities. Treatment is to be given once a month; the patients are instructed to thoroughly care for their teeth daily, using fine salt once a week. It produces stimulation of the gum-tissue, of the alveolar tissue, and of the whole oral structure. This simple but vigorous treatment, by removing the gelatinous microbic plaque which Williams describes, induces the most attractive and apparently most perfect condition of the mouth attainable.

Another subject of particular interest to this body is the law creating a dental service in the United States army, enacted by Congress since our last Session. Although the law as enacted is not all that we asked for, it is an entering wedge which may result in more satisfactory legislation in the future. Dr. Maynard, of Washington, somewhere about the year 1850, was very considerably interested in the enactment of such a law, and used his influence with the President and Secretary of War to have it passed, but without success. In July, 1858, the late Dr. H. J. McKellops, of St. Louis, offered a resolution before the Western Dental Society at Quincy, Ill., with the idea of establishing such a law. It may thus be seen that the movement is not a new one, but that, with the growth of public appreciation of dental services, which is justly regarded as one of the common necessities of life, the demand has been created and recognized. Dr. John S. Marshall, of Chicago, one of our most esteemed and valued members, has been appointed President of the Examining Board of Dental Surgeons of the United States army. And he is a man in every way eminently fitted for this position. The high standard which is

demanding for the appointment of contract dental surgeons under the new law may be recognized from the fact that out of fourteen candidates, only two successfully passed the examinations. Dr. Marshall, in a communication, says, "It is to be hoped, therefore, that our dental schools will not recommend any young men to come before this board who are not thoroughly well qualified, theoretically and practically, in all the branches comprising the curriculum of our best dental schools."

In the department of Biology, science has made some of her most remarkable advances. The work of the investigator has opened up new vistas of relations, of which many of us have never dreamed. In an article entitled "Aspects of Recent Biological Research," recently published in the *INTERNATIONAL DENTAL JOURNAL*, from which time will allow me only the very briefest quotations, Professor E. B. Wilson, of Columbia University, says,—

"Chemical analysis proves that protoplasm is not a single chemical substance, but a highly complex mixture of many highly complex organic compounds, which undergo continual chemical transformations,—indeed, a living cell is doubtless the area of the most complex chemical operations taking place in nature. . . . In the fertilization of the egg, a single cell derived from the father (the spermatozoon) unites with a single cell (the egg) derived from the mother, while the paternal nucleus unites with the maternal. By continued division of the single cell thus formed, arise all the cells of the body. If, now, we examine the details of this process, we find one remarkable difference between the egg and spermatozoon,—namely, that while the two contribute equally to the nucleus of the fertilized germ, the whole, or very nearly the whole, of the remaining cell-substance (protoplasm) is supplied by the egg. We have thus a substantial basis for the conclusion that the protoplasm of the embryo is derived wholly or mainly from the mother, while the nuclei are equally derived from both parents. If this result be placed beside those derived from microscopical vivisection, we gain for the first time a clear, if superficial, view of the mechanism of inheritance, and can form a definite mental picture of the manner in which it is effected. . . . As the paternal and maternal nuclei approach each other within the egg, each undergoes a complicated metamorphosis and finally resolves itself into a number of rod-like or worm-like bodies known

as chromosomes, which are exactly equal in number and similar in form in the two. At this period, therefore, the egg no longer contains two nuclei, but in their place two precisely similar groups of chromosomes, which are respectively paternal and maternal in origin. As the egg undergoes its first division to form the first two cells of the embryo, every chromosome in each group splits lengthwise into two exactly similar halves, which separate and pass one to each of the daughter cells. Each of the latter, therefore, receives two similar groups of daughter chromosomes, paternal and maternal, which are exactly reduplicated in the other cell, and from these two groups in each cell is built up a daughter nucleus, shown by its mode of origin to be equally derived from both parents. At the second division the chromosomes reappear again split lengthwise, and the halves are again equally distributed to the daughter nuclei, and so on throughout the entire life of the animal."

Among the other facts noted in this article by Professor Wilson, is the fact that "The egg may be fertilized by chemical stimulus without participation of the male element. If, for example, the eggs of sea-urchins be allowed to develop in sea-water containing a very slight excess of potassic chloride, the development of the embryo is greatly altered, no skeleton is formed, and a larva results which, though living and vigorous, is of widely different form from the normal ones. If, in place of potassic chloride, lithium chloride be added to the water, the changes are still more remarkable, the embryo never infolding the cells which normally give rise to the alimentary canal, but developing, as it were, inside out. These monstrous forms are of course incapable of nourishing themselves, and ultimately perish, but the result is of high interest as opening the possibility of creating wholly new organic forms by varying slightly the conditions of development. . . . It is certain that new growths of the highest interest relating to the chemical conditions in living matter may be looked for along the lines of research thus opened. . . . Experiments on insects, frogs, and rotifers have already given good ground for the conclusion that sex is in these cases determined by conditions of nutrition, which again in the long run are reducible to chemical conditions. The possibility is thus opened that we may yet succeed not only in fertilizing the egg by chemical means, but also in rendering the organism, male or female, by analogous methods."

In closing I regret that I have not been able to offer any research work, and that the time allotted for this address will not permit the review of many important papers offered to the profession during the last year. I would suggest that the leading symposium for our next year's session be Prophylaxis. Our Section is well fitted to consider this subject, and the recent investigations should stimulate us to earnest and serious work.

The Section is now open for its regular proceedings.

THE APPOINTMENT OF STATE BOARDS OF MEDICAL AND DENTAL EXAMINERS.¹

BY DR. WILLIAM CARR, NEW YORK CITY.

Not many years ago it seemed to the majority, as it now seems to some of those interested in the advancement of medical and dental education, that diplomas from chartered colleges or schools gave sufficient assurance that their possessors were qualified to practise in the general or special fields of medicine in which degrees had been conferred upon them, and that the diplomas granted served as an adequate standard for license. This view assumed that instruction in such schools was faithfully given, by competent teachers, during a period of sufficient length to qualify students for the commencement of their careers, and also assumed that diplomas were conferred only upon those who, at the completion of such a period of study, had demonstrated, upon examination, their qualifications. It also assumed that charters would not be recklessly granted to professional schools, and that such charters would be revoked upon proof of their abuse. Experience has demonstrated the fallaciousness of such assumptions. Legislatures have passed incorporating acts most improvidently. So-called colleges have been created at the solicitation of charlatans having no other purpose in view than the manufacture and sale of parchments conferring degrees in absentia, without any safeguard or State supervision. The Buchanan and Delavan diplomas are

¹ Abstract of paper read before the American Medical Association, Section on Stomatology, St. Paul, Minn., June 4, 5, 6, and 7, 1901.

fair types of the product of these factories, which became a stench in the nostrils of decent men.

An attempt was made to remedy this evil, so far as it affected medical license in the State of New York, by a provision requiring that diplomas granted outside the State should be endorsed by our own schools. But this plan proved of little avail. Not only did respectable colleges endorse fraudulent and valueless papers, but the diploma business was carried on by certain of our native corporations.

It therefore became necessary to do away altogether with the diploma standard, for the reason that it could not be higher than that of the poorest institution authorized to confer a degree.

The plan of creating State examination boards, with power to supervise licenses, next suggested itself. At the commencement of the experiment it seemed to those resorting to the plan that to empower these boards to list the "reputable" schools and to accord to their diplomas only the licensing power, would meet the needs of the situation. In many jurisdictions such listing is still the chief function of the State board, and diplomas of the colleges classified as reputable afford therein a license to practise. But this plan has not proved successful, and the refusal of State boards to list certain of the so-called colleges has given rise to no small amount of litigation, especially in the West, where the right of a State board to exclude graduates of schools refused listing by the board has been vigorously attacked in mandamus proceedings.

In twenty-three States, however, the diplomas of even the best schools no longer afford a license to those upon whom they are conferred, but only serve as one of the qualifications of candidates for examination before State boards. This separation of the licensing power from the diploma has proved beneficial to the really reputable schools, some of whom strenuously opposed it. When the diploma constituted a license, faculties seemed to have been swayed, insensibly, perhaps, by a feeling that the payment of fees on the part of a student, especially if he were somewhat diligent, established a contract right on his part to receive collegiate authority to practise upon the public, and, as a consequence, the standard of education was low, compared with the standard of to-day. With the abolition of this right to license, which was only an apparent, not a real privilege, the value of a diploma was presently perceived to be proportionate to the reputation of the insti-

tution conferring it, which, in turn, was incited by self-interest as well as love of scholarship to raise its standard and confer its degree only upon those earning it. The period of study has been extended, and if the medical and dental laws have accomplished no other result than the raising of college standards, they find in that alone their ample justification.

The examination of candidates for license being vested in a State board, it is of the first importance that such a body should be properly constituted. In the first place, it goes without saying that its members should not only be honest and competent, but independent of extraneous influences, and with eyes single to the performance of their sole duty,—namely, the admission to the profession of men competent to practise and the exclusion of incompetents from its ranks. In order to command respect and authority, it is equally clear that the board should be composed of men of standing in the community and in their profession. Its members should be abreast of the science of the day in its application to their calling, for the rule of liability in malpractice cases takes into consideration the advanced state of science. Without being identified with teaching bodies, these examiners should be conversant with the arts of instruction and examination, able to frame questions of a nature to elicit the candidate's knowledge, and ascertain his ability to apply it. Unless the minds of the examiners and of the examined meet, unless each understands the other's aim, examinations are fruitless, impediments rather than aids.

Again, the office of examiner should be, and is, when proper tests are regarded in filling it, a post of honor. For that very reason it should never be filled by one whose appointment is not made because of his competency to perform the duty with which he is to be charged, but for the sake of conferring honor upon the incumbent. It is but natural that the post should be sought for the honor it confers, and yet a conscientious man, apprehending and purposing to perform faithfully its duties, will be slow to seek it. The position of an examiner upon a negligent or incompetent board is the reverse of honorable, and no man of professional pride and standing would suffer himself to be appointed to such a body.

Unhappily, there have been instances of late—let us be thankful that they did not occur, and could not have occurred, under the

system adopted in the State of New York—of the appointment for personal and political reasons of conspicuously unfit boards. These appointments have been made through the heads of political divisions of the country, and it is but fair to presume that the successful candidates sought the places rather through political influence than by demonstration of their own fitness.

In our State of New York such scandals are not possible. I do not say this to praise our own State board, or to claim for it especial excellence on account of the individuals who compose it. To do so would merely be an exhibition of bad taste, and I certainly have no desire to under-estimate the many excellent, able, and learned men who honor the examining boards of other States. But what I mean to say is, that those very men are wronged and handicapped when the appointing power, for political reasons, associates them with men of lesser qualifications, and this is what has happened elsewhere, but cannot happen in the State of New York, for these reasons.

The University of the State of New York is not a teaching body, nor yet a political body, but is created for purposes of examination and supervision. It has been assailed and criticised from time to time by politicians who would abolish it, and thereby make way for some substitute which would afford patronage through themselves. Fortunately such efforts have hitherto failed, and whatever other criticism may have been made upon the Board of Regents, we have yet to hear any one suggest that its actions have been animated by political or partisan motives.

I sincerely hope that the day is not far distant when each State will have a board of regents, possessing the powers of the regents of the University of the State of New York, or, as suggested by President Henry Wade Rogers, that "there should be established in each State a council of education, which should be invested with powers similar to those of the regents of the University of the State of New York, and it should be composed of the most eminent men of the State, without any reference to political considerations. No degree-conferring power or no degree-conferring institution should be incorporated without the approval of the Council of Education."

With the University lies the power of appointing our boards of medical and dental examiners from candidates nominated by the State societies. The dental board is divided into four classes, the

term of one class expiring on the 31st day of July in each year. Prior to the second Tuesday in June of each year the State society is empowered to nominate from its membership twice as many candidates for filling vacancies to occur on the board as there shall be such vacancies, and from these nominees the regents appoint.

Thus it is sought not only to remove the constitution of our examining board from State politics, but to take it out of professional politics. The State society, the purpose of whose incorporation is to assemble together men to whom the interest of the profession, its advancement, and honor are dear, and membership in which is open to all who are of good standing in the profession and chosen from their districts as representative men, has power to say to the regents, "We submit to you the following names of men who, in the opinion of the dental profession throughout the State, are fit and worthy to represent it. But we cannot appoint, we cannot by intrigue constitute the board; that must be done by the regents, and with them rests the responsibility for ill-advised selection, limited only by our responsibility in submitting poor material for their choice." Thus there is a double responsibility created: we are responsible for our nominees, and the regents for their appointments; and thus it is that we have removed, so far as human ingenuity could do so, the constitution of our board from the hands of the politicians; and if I have spoken of our system of licensing dentists as good, I have still spoken less strongly than Dr. Allen, secretary of the advisory committee of the National Association of Dental Faculties, who, writing under date of November 15, 1899, for "A Comprehensive Report from the New York Examiners," was kind enough to say of the body to which he belonged, "The entire committee regard the New York dental law as the best in the country." (See Regents' Bulletin 9, February, 1900, *Dentistry*, page 751, note.)

Before the board thus constituted come the candidates for license, after satisfying the Board of Regents that they have been graduated from the professional schools after receiving the proper preliminary education. But the examiners do not know the candidates who appear before them, or the schools from which they come. To guard against any possible favoritism, candidates are examined by number, and it has even happened that men have appeared before the board who have slipped by the outposts, and have passed the professional examination without having satisfied the

preliminary requirements, with the result that their success in passing the State board has yet failed to license them to practise within the State of New York, by reason of their failure to comply with the preliminary requirements.

The success of our system, therefore, depends upon the existence in the State of New York of our University, which, while controlling all educating bodies, does not itself possess a teaching faculty; thereby have we been able to keep our board out of politics and have been able to create a double responsibility for its appointments.

That we have excluded from the profession all incompetents would be claiming to be something more than human; what we can safely maintain, however, is that we have guarded the entrance to the profession not only with sentinels, but with watchmen over the sentinels.

THE DENTAL COLLEGE STANDARD.¹

BY CHAS. C. CHITTENDEN, D.D.S., MADISON, WIS.

- (a) Is it what it should be?
- (b) If not, what improvements should be made?
- (c) How may the requirements be improved?

In order to intelligently consider the subject in hand it will be well to first define if possible what is the dental college educational standard as at present accepted in this country?

Much agitation and discussion of the subject has for the past two or three years occupied the attention of the journals and the various dental societies, from the national bodies down to the smaller local organizations, as to what the standard should be. The fact also is that until 1899 there never was any established standard in this country, each school being a law unto itself as to whom it should matriculate and graduate. The national examiners sought for years to induce the National Faculties Association to establish a minimum standard as a basis from which to go forward, but it was not accomplished until an open rupture brought

¹ Abstract of paper read before the American Medical Association, Section on Stomatology, St. Paul, Minn., June 4, 5, 6, and 7, 1901.

the two national bodies together at Niagara Falls in 1899 in a conference, which resulted in the following code of rules being placed on the records of the Faculties Association:

"The minimum preliminary educational requirement of colleges of this Association, for the session of 1899-1900, shall be a certificate of entrance into the second year of a high school, or its equivalent, the preliminary examination to be placed in the hands of any State or county superintendent of public instruction."

Amended Rule VIII., National Association Dental Examiners, Sec. 2, is as follows:

"The following preliminary examination shall be required of students seeking admission to colleges recommended by this Association: The minimum preliminary educational requirements of colleges of this Association for the session of 1900-1901 shall be certificate of entrance in the second year of a high school, or its equivalent, the preliminary examination to be placed in the hands of the State Superintendent of Public Instruction, as adopted by the State Board of Missouri."

Also, "The minimum preliminary educational requirement of colleges of this Association, beginning with the session of the year 1902-1903, shall be a certificate of entrance into the third year of a high school, or its equivalent, the preliminary examination to be placed in the hands of the State Superintendent of Public Instruction.

"Nothing in this rule shall be construed to interfere with colleges of this Association that are able to maintain a higher standard of preliminary education."

The above represents the exact situation at this time,—to wit, present standard, one year of high school; promised standard for 1902, two years of high school, with the agreement between the two bodies that all schools belonging to the National Association of Dental Faculties and living up to its standards and requirements as laid down shall be accepted as reputable by the examiners and recommended to the various State boards for recognition. The regents of Michigan, under the advice of the venerable dean, Jonathan Taft (to whom be all honor), took the initiative in setting the pace, and required high school graduation for 1900. The regents of New York will in 1902 culminate a progressive advance in requirements to full high school standard. At the

World's Dental Congress in Paris last summer high school graduation was made the international standard for entering dental colleges. So it would seem quite certain that, viewed at large, high school graduation is accepted as our *ultima Thule*.

The National Association of Dental Faculties is a body composed of the membership of fifty-one dental schools, all of which accept and agree to conform, in the conduct of their schools, to the regulations and rules formulated by that body. However much these schools may vary in their equipment, faculty, and general effectiveness as educational institutions, yet, as long as they retain their membership in that body, all, by special agreement with the examiners, command the same privileges and recognition subject to the various dental laws in nearly all the States, membership in that body being now accepted by all State boards as the criterion of reputability before the law. This Association, backed at all times by the National Association of Dental Examiners in its every forward move, has in the eighteen years of its existence wrought wonders in the development and unification of *curricula*, the evolution of dental technics, lengthening course of study and special training, and in a hundred ways making the advantages offered for obtaining a complete dental education and equipment almost ideal; so that the student who comes to the dental college to-day prepared and fitted to assimilate and appropriate what may be his own for the mere taking, has no excuse for leaving school unprepared to enter successfully on the practice of dentistry.

The code of rules and standing resolutions formulated by this Association for the government of its members in the conduct of their schools is a monument of sense, wisdom, and ethics which would redound to the credit of any deliberative body of men having the interest of their calling at heart, and yet, strange to say, never, through all the years of its existence, has it seemed to occur to it to effectively inaugurate and establish any given educational preparation as a minimum standard requirement for entering the dental college course, until the one-year-of-high-school rule above quoted was adopted, and that only after the demonstration of much friction on the subject between the Examiners and Faculties. The query arises naturally why this important subject was so long ignored. But one logical answer suggests itself,—namely, the different schools, or, at least, a majority of them, preferred to retain

in their own hands the decision, without dictation from any source, as to the fitness of an applicant for matriculation. This power of discretion was safely lodged in schools that were State institutions with equipment and financial resource sufficient to meet all current expenses and salaries, regardless of the number of students matriculating, and those with assured attendance large enough to leave out any temptation to admit applicants for financial reasons only. But only a small proportion of the schools have been thus situated. Indeed, most of them must have a given number of students to keep them from bankruptcy, and so, at least, there was a door of temptation open for the acceptance of credentials that ought to have been better than they often were. In fact, at Niagara, in 1899, the chief argument used by college representatives against the fixing of a two-years high school minimum requirement was that it would prove the financial ruin of one-half the schools of this country. But what is the fact? Since the first bar was put up the attendance in dental schools has not only not diminished, but has increased,—at least, in all the better-equipped schools. The experience of the Medical Department of Johns Hopkins is a great object-lesson in this regard. Some years ago, because of the increasing size of its classes, and in the hope of restricting them, the entrance requirement was raised first to high school graduation and then to the possession of an academic degree, all of which only served to increase the number of applicants for matriculation, thus proving a well-known axiom, that the more highly one holds his wares the more eagerly are they sought.

There is probably no doubt that if the higher standard could be successfully inaugurated and established, it would work a very marked improvement in the quality of student material entering our schools, a consummation, from the stand-point of us all, most “devoutly to be wished.”

Accepting, from what appears to be the inevitable tendency of events, the high school graduation standard as a condition to be desired, the question at once presented, How can it be inaugurated without working injury to the college interest? The answer is that the colleges, by joining forces with the boards whose duty it is to enforce the dental laws, can at once establish and maintain, without friction or disturbance, to the interest of all concerned, an immediate advance of matriculation standards to high school graduation. This as a general proposition will stand.

However doubtful may be the comparative power and strength, legally and morally, of the faculties and examiners when at variance with each other, there is nevertheless no limit to their power and ability to maintain any given standard of educational requirement within reason, as a basis of accepted reputability before the public, made and provided these two representative forces agree to work honestly together to that end. This fact has been lost sight of too long by the colleges. No matter if the appointment of examiners is dominated by political pulls, or if many of their men are incompetent, pig-headed, and far from fit representatives of our ideals (as has been often charged), still it must be always remembered that these men represent and are intrusted with the administration of the law, and the law always dignifies its chosen administrators. No matter if the many State laws bear evidence of weakness and inefficiency, and are apparently at great variance with each other in their provisions and standards, if scrutinized carefully they will all be found to demand that colleges shall be reputable. This one feature of uniformity in ethics makes it possible for the teachers and examiners, backed by the moral support of the profession at large, to establish and maintain in every State of the Union any educational as well as ethical standards on which they are agreed to be of one mind.

While the Faculties Association's rules give the individual college absolute control over the behavior, standing, advancement, and transfer of the entered students,—thus making it impossible for one of them who has fallen short of passing muster in one college to be admitted to another school without the full consent of his Alma Mater,—while, I say, all this obtains after a student has matriculated and been given standing, there is at present nothing to absolutely prevent a man whose credentials have been refused by one school bobbing up serenely before the dean of another school, and having standard given him on the same credentials. This commercial and competitive temptation, which is the chief obstacle in the way of successfully establishing a uniform advanced standard requirement, can easily and only be overcome by such wise and careful legislation on the part of the Faculties' Association as has distinguished it in handling many other no less delicate questions. In the many discussions of this subject of preliminary education the argument has been made, and stoutly supported by the facts, that a large number of the most eminently

successful of our profession are men who had practically no educational opportunities before embarking on a professional career, and, therefore, that to set a fixed and arbitrary standard would in effect often bar out those who might become, with opportunity, shining lights. Of course, all will admit that such men would be much better equipped with proper educational preparation, and, indeed, for such very good reason every fixed standard that has been agreed upon or that is contemplated for the future is modified by the words, "or its equivalent," to give the aspiring student his chance, no matter if his educational opportunities have been curtailed by environment.

How shall a fair, honest judgment as to what constitutes the equivalent of any given standard be secured, and who shall pass such judgment? On this question being properly answered hinges the successful establishment of any prerequisite standard. All will admit that, however well equipped a man may be as instructor in any branch of dental education, yet, by that very fact, he is sure to be at least rusty and out of practice on public school examinations; and certainly the college teacher will admit that the politically appointed examiner is likely to be fully as unfitted as himself.

Mind, the new Rule VIII., jointly adopted at Niagara in 1899, provides thus: "The preliminary examination to be placed in the hands of the State Superintendent of Public Instruction, as adopted by the State Board of Missouri." Manifestly—since it is not to be presumed that the dental profession has the power to prescribe special duties for any State officer—the intention and expectation was that the State Superintendent of Public Instruction of each State having dental schools should be requested to select and appoint some person specially fitted, in his judgment, to pass upon credentials and properly conduct the preliminary examinations of intending dental matriculants in the colleges of that State. Of course, the State Superintendent is a "political creation," but his special appointee for this particular work may practically be satisfactorily agreed upon between the college and State board. Thus would the college dean be relieved from the ever-perplexing responsibility of passing upon all sorts of so-called credentials, such as every dean has presented to him, credentials many of them so plausible as to easily pass muster if only casually scanned, and which the dean feels certain, should

he refuse them, would be cheerfully accepted, along with the student and the fee, by another dean somewhere.

Eliminate all this. Make it absolutely impossible that a matriculant can be given standing in any college on credentials until these credentials shall have been passed upon, first, by the accredited representative of the State superintendent, and then finally accepted or rejected by the joint conference committee of college and board. Make their decision, in the interstate and intercollegiate sense, final, and add, if you choose, a reasonable probationary clause providing the applicant a way to make up his shortcomings without abandoning the study of dentistry. In other words, make the general rule jointly accepted at Niagara practically effective and universal by the two national bodies formulating specific rules for its application in every State, territory, and district where a dental school exists. This plan has been successfully operated in more than one State, and if it, or some other one equally practicable, could be inaugurated and applied to all schools alike, one of the chief temptations to commercialism and competition rather than emulation would be eliminated, and each school would stand or fall according as its intrinsic merits command recognition.

LICENSE: A, DIPLOMA; B, EXAMINATION.¹

BY J. A. LIBBEY, D.D.S., PITTSBURG, PA.

A COLLEGE chartered by the State for the purpose of educating students, whether it be a classical course or upon some special branch, employing well-qualified teachers, who are thoroughly in earnest in their work and loyal to their profession, and are desirous to see only those who are thoroughly competent enter it, who count the qualities of the student of more value than the profits of the institution, should have no other requirement for entering upon professional work than a diploma from such a school.

It is evident that the schools are not all conducted on a basis like this, for the reason that there must be sufficient funds to defray

¹ Abstract of paper read before the American Medical Association, Section on Stomatology, St. Paul, Minn., June 4, 5, 6, and 7, 1901.

all expenses, including the assistants' salaries, and sufficient dividend to justify the faculty or incorporators for the valuable time taken from their practice; not considering the added tone and dignity of being called "professor" (which is frequently used for profit).

The question arises, "How many students can we get at \$—— apiece?" If one hundred are secured, it will be difficult to get sufficient clinics for demonstration; how will this be accomplished? The usual way is to urge the students to solicit, not among the poor and needy, but among their own class of people, who are usually able to pay a fair fee.

"A chain is no stronger than the weakest link." If license by diploma is accepted, then the poorest school sets the standard for all. Hence the necessity of licensing by examination.

The necessity for examination is not a new idea; it can scarcely be called a modern one, for in 1700 a French writer urges the necessity of examinations in France, for the practice of dentistry.

The history of reform in the dental profession in England, by Hill, conclusively shows not only the necessity of requiring examinations, but also the advancement from a scientific and professional stand-point, by which the people were the beneficiaries. On page 86 he quotes the remarks of the president of the Odontological Society (the late S. Cartwright, Esq.). "It cannot be doubted that a liberal education is of the greatest advantage to those engaged in practice, and the more education is extended in all ranks of society the more it becomes necessary that the members of our profession qualify themselves as highly as they can, for those who employ the services in these days have a right to look, and do look, to the qualities of the mind as well as mechanical adroitness of the fingers."

The main object of the above society was to unite members of the dental profession into a recognized body, and provide a means of professional education and examination.

In nearly every criticism on dental legislation, or State board of examiners, the author gives the impression that the laws were passed for the benefit of the profession; if such were the case, they should be repealed, as class legislation is in direct opposition to the principles of our government. The laws were made for the people.

The medical laws are similar to ours, and the profession of

law requires the same. In the writer's State (Pennsylvania) a law student must pass a preliminary, and after graduation must pass an examination before a board appointed by the court, the only persons competent to appoint that board.

The best means possible should be adopted to test the qualifications of the aspirant to professional practice, and the most important is a judicious selection of competent examiners. As stated above, the court appoints the examiners for the law; they are the most competent to perform that duty, but would prove themselves unqualified were it required of them to appoint a medical board.

No one is competent to appoint a board for professional examinations except members in good standing in that profession. The difficulty of securing competent men for examiners in our profession arises from the necessity of their being appointed by the governor, thus making them officers of the State, and he, being authorized to appoint, may be ill advised in the selection.

As the court is the representative body of the profession of law, and is competent, the only representative body of the dental or the medical profession in the State is the State society. It should be a State society in fact as well as in name, which is not the case in some States. It must be chartered by the State, and to be a representative body must be made up of representatives (or delegates) from the local societies throughout the State. Act of 1897 (Pennsylvania), gives the power of appointment to the governor, and the selection to the State society (which is a representative body): "Section 5. The Pennsylvania State Dental Society may, at its annual meeting in one thousand eight hundred and ninety-seven, and annually hereafter at said meeting, select as nominees the names of double the number of examiners required, who shall be members in good standing of the Society, and transmit such names to the governor under its seal and signed by its secretary. From this list of nominees the governor shall, during the month of August, Anno Domini one thousand eight hundred and ninety-seven, appoint a board of dental examiners. In case of failure of the said Pennsylvania State Dental Society to submit such list, as aforesaid, the governor shall appoint members in good standing of the said Society without other restrictions. Each one of the said appointees must be a registered, *bona fide* practitioner of dentistry in good standing, and shall have

practised dentistry under the laws of this State for a period of not less than ten years. No member of a dental college faculty shall be eligible to appointment upon the State Board of Dental Examiners, but this shall not apply to membership in the Dental Council. The governor shall fill vacancies by death or otherwise for the unexpired term of said examiners, from the list of names submitted to him by the dental society."

Since the present law went into effect, eight hundred and twenty-three applicants have been examined (these were graduates from eighteen different schools); of this number, seven hundred and eleven passed successfully and received licenses from the Dental Council; one hundred and twelve failed to receive the required average, a fraction over thirteen and one-half per cent.

"The measure had an *ex post facto* character, inasmuch as when it was passed many students had already spent two years in the dental schools, and in recognition of this fact the board of examiners has been lenient in the examination of applicants. This has no doubt aided in fostering good will towards the law. The influence of the work of the board of examiners has been beneficial, in that it has given a stimulus to the teaching in the schools, and has induced stricter scrutiny of the acquirements of candidates for diplomas. Formerly students often sought the schools from which they could be graduated most easily, but now they prefer those that require a higher standard."¹

If the board had marked the first two years, as they have since, the percentage of failures would have been doubled, as fully that number barely passed the required average (seventy-five per cent.). When the profession and the people realize the condition that now exists, there will be no difficulty in getting laws passed that would be a real protection against quackery, and contribute to hasten the time when the stomatologist will take the degree of M.D., leaving the name "dentist" to designate those who do only mechanical work.

¹ Extract from report to the governor.

REVENUE FOR CONDUCTING THE WORK OF THE BOARDS OF DENTAL EXAMINERS.¹

BY DR. V. E. TURNER, RALEIGH, N. C.

(A) BY TAXATION OF THE PEOPLE.

ALTHOUGH one of the main objects of examining persons wishing to commence practice is to secure protection for the people from inferior dental service, it would seem for such immunity the people should be taxed as they are for any other protection which the law affords. This is doubtless the correct principle. As the members of the State boards are State officers, it would seem most rational that they should be paid as other State officers.

But there would be great difficulty in influencing such legislation, as any proposed enactment relating to dental surgery or any branch of medicine which carried with it a draft upon the treasury of a State would excite the opposition of the average legislator. It would not be expedient to ask this, as it would be fatal to any further amendment to our present dental laws. In fact, in some of the States it is specially provided that under no circumstances shall these dental enactments be of any expense to the State.

(B) BY FEES FROM THE EXAMINATION OF CANDIDATES.

All things considered, the most satisfactory plan of securing compensation for the service rendered by members of the State examining boards should be derived from the fees received from the applicants for license. All legislation prescribing and controlling the standard of qualifications of licentiates in dental surgery has been effected through the influence of State dental societies, and every one will concede that such enactments are of great benefit not only to the profession, but to all reputable practitioners, in maintaining a higher standard of professional attainments, which gives more dignity and a higher consideration among the other professions as well as the public.

The amount of compensation should be to some extent commensurate with a reasonable expectation of income to be derived

¹ Abstract of paper read before the American Medical Association, Section on Stomatology, St. Paul, Minn., June 4, 5, 6, and 7, 1901.

from these fees. Of course, in some States it would be larger than in others, but a per diem of ten or fifteen dollars, and three cents mileage, would not be extravagant remuneration for members of examining boards, except the secretary, who should be paid twenty-five dollars per annum additional.

If these and such other legitimate expenses should aggregate less than the amount of fees received, the balance should be turned over to the State society for conducting scientific research or other educational purposes. If these amounts should aggregate more than the fees, then the State society should supply the deficit.

In addition to these duties, each member must prepare suitable question lists before the meeting, and examine the replies after, in order to give the proper grading to each applicant examined, and both of these require the exercise of much thought and judgment.

(C) BY TAXATION OF THE PROFESSION.

If this should be necessary, then the profession should not hesitate to bear that burden for the sake of the benefit which is derived from a proper discrimination between the worthy and qualified and the unworthy and incompetent, and in order to prevent the lowering of the standards of professional equipment and to provide against the advent of those who pursue the calling as a hustling business rather than a learned and dignified profession.

REVENUE FOR CONDUCTING THE WORK OF STATE BOARDS OF DENTAL EXAMINERS.¹

BY DR. GEORGE L. PARMELE, HARTFORD, CONN.

In this "Symposium on State Boards of Dental Examiners in their Relations to the Profession and the Colleges," I am asked to deal simply with this subdivision: "How shall the Revenue for conducting the Work of the Boards of Examiners be obtained?"

(a) By taxation of the people.

¹ Abstract of paper read before the American Medical Association, Section on Stomatology, St. Paul, Minn., June 4, 5, 6, and 7, 1901.

(b) By fees from the candidates.

(c) By taxation of the profession.

Naturally our first inquiry would be as to the causes bringing about dental legislation, and the purpose of such laws.

The majority of the dental world labor under the idea that these dental laws were passed to protect the dentist from the dentist; that is, to bar out the dental parlor man and admit to practice only those who will live up to the code of ethics; but notwithstanding the fact that more or less selfishness on the part of the dental profession prompted their advocacy of such enactments, the laws are for the safety and welfare of the people.

This being the case, you say, let the people pay.

No doubt there are many good reasons why the people should pay; for example, were the people taxed, then many worthy but financially embarrassed young candidates, who have expended their last hard-earned dollar at college, would not be required to wait until they could earn enough to satisfy the demands of the State boards, although I think all candidates would be better off if they would serve as assistants with some successful practitioner. There they would gain experience, not only in the manipulation necessary to the care of the dental organs, but learn, what is vastly of more importance to them at the outset, how to deal with people and to meet the many petty but important details of daily routine in a successful professional office.

Let us leave class "b," "fees from the candidate," while we quickly dispose of class "c," "taxation of the profession."

In our professional ranks there are many generous, whole-souled, self-sacrificing men, but when we talk of securing the revenue by taxing the profession, it means the whole profession, and, judging from my own experience with the average dentist, it would be a greater task to get the dental profession to allow itself to be taxed, so that other dentists might enter into competition with them, than it would be to get the people, the free and enlightened voter, to submit to taxation in order that another voter might carry on his business.

This brings us to the only other source of revenue, "b," "the candidate."

When I was requested to prepare this paper there came upon me a sudden elation, for it seemed that for once I knew where to go for the desired information.

In a chat with a lawyer along the lines of dental legislation, he gave me the impression that the State should pay the costs of examination, but alas! when I hastened to him, note-book in hand, I found that I had misunderstood his remarks. Our talk had been of a certain retroactive clause in a proposed dental bill, and that which he had intended to say was, that if this bill should pass it would be a hardship to compel certain ones to pay a second fee, and, in justice, the State in this case should be responsible.

Continuing the conversation after I had stated the question I was to deal with, the attorney assured me that so far as he was informed of the various license granting powers, there could be but one answer to the question.

Later investigation has convinced me of the soundness of his opinion.

In the work of various other boards,—for example, health, forestry, fisheries,—the expenses justly come from the public funds, as the benefit is not for individuals, but for the people; but in the case of a license to carry on some trade or profession, whereby an individual is allowed certain privileges, the individual should pay the costs, notwithstanding the fact that the laws governing such cases are enacted for public protection.

Let us glance for a moment along the various walks in life where licenses are required before one can enter their ranks, and see, by actual reference to a few State laws, from what source the revenue is obtained.

Georgia, State Board of Embalmers, license five dollars, from the candidate.

Ohio, physicians, dentists, and druggists, fee twenty-five dollars, from the candidate.

South Carolina, Homœopathic Board, fee five dollars, from the candidate.

New Hampshire, plumbers, fee one dollar for examination, fifty cents every year, from the candidate.

Virginia, medicine and surgery, fee ten dollars, from the candidate.

Nebraska, barbers, examination one dollar, and annually one dollar, from the candidate.

Michigan, barbers, examination five dollars, and annually fifty cents, from the candidate. Barbers in business at passage of law, one dollar, and annually fifty cents.

Tennessee, osteopathy, fee from candidate for recording diploma from one named college, one dollar; all not so recorded, fine one hundred dollars.

This list could be continued indefinitely, and would still have the refrain, "from the candidate."

"Where the successful prosecution of a calling requires a certain amount of technical knowledge and professional skill, and the lack of them in the practitioner will result in material damage to the one who employs him, it is a legitimate exercise of police power to prohibit any one from engaging in the calling who has not previously been examined by the lawfully constituted authority and received a certificate in testimony of his qualification to practise the profession.

"It is the common custom in all the towns and cities of the United States to require the payment of a certain sum of money as a license fee, for the privilege of prosecuting one's profession or calling. The license is required indiscriminately of all kinds of occupations, whatever may be their character, whether harmful or innocent, whether the license is required for the protection of the public or not. . . . It is either a license, strictly so called, imposed in the exercise of the ordinary police power of the State, or it is a tax laid in the exercise of the power of taxation. In many cases it becomes exceedingly important to determine under which power the particular license is imposed. For example, if the license is a tax, the bill must originate in the House of Representatives, according to the almost universal requirements of constitutional law. But if it is a police regulation, the bill providing for it is constitutional in whichever house it was introduced.

"It is one of the 'ways and means' of defraying current expenses."¹

A license tax has been held to be reasonable when imposed upon venders of milk, hucksters, pedlers, venders of cigarettes, upon attorneys, physicians, bankers, hacks and drays, and other vehicles. So, likewise, may such tax be exacted of keepers of places of amusement, of dealers in second-hand articles, pawnshops, insurance brokers, auctioneers. In short, the State has the power to impose a license fee as a tax or a police license upon every kind of business.

¹ Tiedeman's Police Regulation of Skilled Trades and Professions.

"In the regulation of all such occupations, it is constitutional to *require those who apply for a license to pay a reasonable sum* to defray the expenses of issuing the license, and what is a reasonable sum must be determined by the facts in the case.

"When a municipal corporation is given the power to license useful trades or occupations, it cannot use the license as a tax to raise revenue, nor is it authorized to entirely prohibit the exercise of the trade or occupation by any excessive license fee."¹

Mr. Justice Manning says, "A proper license tax is not a tax at all within the meaning of the constitution or even within the ordinary signification of the word tax. . . . The imposition of a license tax is in the nature of the sale of a benefit, or privilege, to the party who would not otherwise be entitled to the same. The imposition of an ordinary tax is in the nature of the requisition of a contribution from that which the party taxed already rightfully possesses."

I have examined all State laws concerning dentistry, numerous other laws, and legal authorities, and so far I have not succeeded in finding a single case where the costs did not fall upon the applicant; therefore, in answer to the query, "How shall the revenue for conducting the work of State boards be obtained?" I reply, "From the candidate."

Reviews of Dental Literature.

"THE DEMANDS FOR TOOTH HYGIENE." By Dr. Ernst Jessen, Strassburg.²—The contents of this valuable article can best be given by a few quotations of important passages. In speaking of the advantages of public hygiene the author says, "The necessity of a systematic, well-regulated care of the health of the people has not as yet received general recognition. An intelligent care of the people's health must include a care of all conditions of life, as, for example, of dwelling-houses, of clothing, of food, of school hygiene. The care of the health of the people must begin with

¹ American and English Encyclopædia of Law.

² Zahnhygienische Forderungen, von Dr. med. Ernst Jessen, Deutsche Monatschrift für Zahnheilkunde, 6. Mai, 1901.

the children, in order to make their bodies strong and well developed, and to protect them against all sorts of pathogenic influences. For health is the marrow of the people. The interest in public hygiene has recently and in a marked way engaged the attention of the dental profession. The examinations conducted among school children and soldiers bear witness to this. These examinations have shown how necessary and important attention to dental hygiene is for the public health, and also show that the public school is the only proper place for such care. The improvement of the public health through better care of the teeth can only be accomplished in the school. For this reason the authorities must take the matter in hand. A regular yearly examination of the teeth will be sufficient. In some cities this is accomplished. In Strassburg all school children—sixteen thousand in number—have a yearly dental examination.”

The author then proceeds to describe the method by which the results of these examinations are registered and the way in which necessary work on the teeth is performed at the clinic connected with the University of Strassburg. Each child is also furnished with a card containing twelve maxims in regard to the care of the teeth, and I append a translation of them, as follows:

1. At the age of two and a half years every child has twenty teeth.
2. At six years the large permanent grinding teeth appear in the back part of the mouth.
3. From the seventh to the fourteenth year the change lasts.
4. In the twelfth year appears the second large grinding tooth. Between eighteen and forty appear the wisdom-teeth.
5. Sound teeth are necessary for the stomach and the health of the entire body.
6. The milk-teeth have for the child the same value as the permanent have for the adult.
7. From youth up the teeth must be thoroughly brushed every morning and especially every evening.
8. Each year ought the teeth to be examined by a dentist.
9. As soon as there are cavities, they must be filled before pain appears.
10. Sound milk-teeth are necessary for sound permanent teeth.
11. In order to keep the oral cavity healthy, all roots which cannot be filled should be extracted.

12. The natural teeth must be preserved, since artificial teeth are only a help in necessity.

What has been accomplished for the care of the teeth of school children in the city of Strassburg should, according to the author, be accomplished in every German city. And he calls upon teachers to instruct their pupils in the use of the tooth-brush. And where poverty precludes the use of a brush, the practice of rinsing the mouth with a salt-and-water solution should be insisted upon.

Finally the author dwells upon the necessity of the care of the soldiers' teeth and of the care of the teeth of patients in hospitals.

WILLIAM H. POTTER, D.M.D.

BOSTON.

Reports of Society Meetings.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology of Philadelphia was held at the rooms of the Academy, 1731 Chestnut Street, on the evening of Tuesday, April 22, 1901.

In the absence of the president and vice-president, Dr. E. T. Darby occupied the chair as president *pro tem*.

The President.—As Chairman of Council, I would report that the essayist of the evening has failed to present himself, for some reason unknown to the Council.

In the absence of the essayist and his paper to-night, a short paper will be read by Dr. J. C. Curry.

Dr. Curry.—Mr. President and Members of the Academy, I think it is hardly fair to dignify my contribution by calling it a paper. As I had no idea of saying anything until this morning, and did not find out clearly just what I was going to say until to-night, and am not quite sure of the matter now, I will try to reward your indulgence by being brief. The subject that I wish to bring before you is that of quack dentistry, and I would say at the start that I shall take it for granted that every legitimate dentist is entirely competent to take care of himself, and I will speak for the public only.

Within the past ten years there has been an influx of quack

dentists, who are becoming more numerous, daring, and dangerous, and it seems to me impossible for our educational institutions to compete with these pests unless they have the hearty co-operation of every organized body of dentists, as well as of every individual dentist who has the welfare of the public and his profession at heart. Neither the colleges nor the State boards can make a man honest, and the man who graduates from a college a skilful rogue soon becomes a conscienceless charlatan. He is absolutely unscrupulous in obtaining the confidence of the people and their money; he is careless in his methods, and resorts to malpractice in most cases. Of course, the natural reply to this would be that the public should know better, but how can people know better unless they have been taught, and who is better able to teach them than we who know? They themselves find it out after it is too late and after they have suffered keenly. We must remember that the people who patronize these places are for the most part, though not entirely, from the middle and lower classes, who are driven by actual necessity and are hampered by lack of time and money. They are, for the most part, ignorant of our profession, because they have never been taught. How can they be otherwise? I believe it to be the duty of the dental profession to devise means of reaching the public and stopping the wholesale malpractice which every one of us here knows is going on uninterruptedly, every day, Sundays and evenings included. It is not enough to say that we have dental colleges for the protection of the public against unskilled professional men, or that we have State boards to support the colleges. It is not lack of skill I am complaining of, but it is the lack of principle with which these institutions, the advertising offices, are carried on. The average individual who goes about his work from seven o'clock in the morning to six at night has not time to investigate their methods, nor the time to go to a dentist and make an appointment, and in the majority of cases he cannot afford the expense of first-class work. He is shown the advertisements of these quacks and led in a number of ways to believe that they are public benefactors, and he goes to them. In the majority of cases, however, he is very sorry for it all his life.

We have all sorts of safeguards thrown about the public, but I believe that at the present time there is no way to reach the unscrupulous quack dentist. The people who go to these establishments to get services are fleeced of their money, and when they

make complaint they are laughed at and told to go to some place else, or anything that happens to come to the mind of the proprietor. They cannot afford to bring a civil suit for damages, and the result is they pocket their losses, and their teeth usually, and go their ways sorrowing.

I would simply bring this subject before our Society for discussion. There usually is a way to right most of the wrongs. There surely is a way of reaching an intelligent public. We believe the American people is an intelligent people, and I think there ought to be a concerted movement all over the country to stop this deception. If I should speak from the stand-point of the dentist, I would appeal to you through your professional pride. I would say to you that it does not make a dentist feel very proud to be introduced as a dentist, when Dr. So-and-so is advertising to sell teeth at one dollar and ninety-eight cents per set. I would also say that the young men who are graduating from our schools to-day are thrown out upon the large cities and have to compete with these men. They have neither prestige nor experience to fall back on, and a great many of them have not very much money, and thus many of them are driven into the offices of these quacks as assistants. There is not a living for them unless they do go into advertising offices.

DISCUSSION.

Dr. Kirk.—I think that the subject is a very important one, but whenever this topic comes up, either for discussion in any dental meeting that I have attended or whether it comes up in the journals, I am always reminded of the attitude of Abraham Lincoln towards the man who was persistently requesting an audience with the President, and finally succeeded in getting in, and then read to him an original poem some several pages long, dealing with the beginning and end of the universe, and so on, which he read with a great deal of impressiveness; and when he finished he said,—

“Now, Mr. President, will you tell me what you think about it?”

And it is said that Mr. Lincoln considered the matter very carefully and replied,—

“Well, if anybody likes that kind of thing, that is just about the kind of thing they like.”

Now, the application of this matter to the present case is this: The people that do not know any better than to patronize advertising establishments make very undesirable patients. I had more or less a feeling of gratitude myself that there were such places, as it furnished an outlet for the patients that I personally did not want to have.

I have no doubt that a great deal of harm is done and that a great many teeth are slaughtered, and no doubt that, in the aggregate, a great amount of money is taken away from an unsuspecting public. On the other hand, we have the evidence, in a few cases, that some of these men who are what might be called "quacks," while they are doing an advertising business and not advancing the profession, are endeavoring to conduct their practices upon business principles. There was a man who died not long ago who was noted for the fact that he did carry on an honest advertising business and had amassed a considerable competence. I mention that on account of what I believe to be true,—*i.e.*, that the advertiser is not necessarily an irresponsible quack. Just how the evil is to be cured I do not know. I do not know of a better suggestion than the one made by the essayist, that of educating the public. As to the details of the plans of doing that successfully, I must confess my inability just at the present time to see any method by which that could be properly done. Dr. Curry suggests an organized movement, an organized attack upon this difficulty throughout the country. I should be glad to know just what he means by that. There is always the danger in such an organized attack of putting these men on the defensive and in the position of being persecuted, and thus arousing public sympathy on their side. It is a very delicate matter to handle, and the desired end may be defeated by awakening that kind of sentiment against the individuals who are the attacking party.

Unfortunately the press of the country is almost solidly in favor of these men, simply because they derive large incomes from their advertisements. It is very difficult to get any paper, I think, to take up a warfare against these men. They want some better reason than we are able to give that it is unprofessional before they will cut off a fairly good source of income. The problem seems to be insoluble in so far as the details of doing the work is concerned, and yet I believe that the difficulty is to be met only as has been suggested by the essayist, by proper education of the public, so that

they may be brought up to a proper appreciation of what good dental service means.

Dr. Ellerbeck.—I have not much to say on this subject, but I view it as presented by Dr. Curry particularly from the side that relates to the public and very little from the aspect of the quack dental parlor. We know that that subject has been discussed through the journals since the beginning of the formation of dental societies, without a great deal of good. As Dr. Curry and Dr. Kirk have said, the matter rests with the education of the public. As to the proper method of bringing about that education, it seems to me it can only be done through the education of the school children, who should be taught the proper care of their teeth and, incidentally, the right place to go to get proper treatment.

I would like to hear a discussion of the possibility of having examining dentists in the public schools, and of the best means of bringing that about throughout the country generally.

Dr. Brubaker.—I would like to ask one question. What reasons can be assigned for the rapid increase of commercial dentistry in this country? I would like to hear from some of the older members of the profession.

Dr. James Truman.—Before the inauguration of State boards in this country we had quacks, but they were limited in number and in power. At the time that the State boards were organized throughout the country these very same men evidently made up their minds that another method must be adopted in order to overcome the statute. They organized these so-called "dental parlors," and, instead of running them themselves, with perhaps some inefficient assistants, they called to their aid young men who had just graduated, who, being without much means, perhaps none at all, in order to get along, were willing to accept the positions under these men. Having those young men with them, they did a better class of work. I am not prepared to say that the work that is done in these parlor establishments is not quite as good as that done in the clinics of our colleges.

I know nothing about them further than that they began practically with the establishment of laws regulating dentistry, and have increased just in proportion to the severity of those laws, and not only increased in this State, but have increased in every State of the Union, and in almost every town. I do not know that the application of law would help the matter at all. I see no help for

it. I question very much whether the education of the children of the public schools, while it would be a great advantage unquestionably, would teach these children to go to the proper dentist. The general feeling is always to get things as cheap as possible. This is seen in the stores, where the bargain-counter is crowded all the time, even when people know they are getting an inferior article. So it will always be with these parlor establishments, or establishments where they advertise a cheap article. I see nothing for it but a proper education of the people as to what is good dentistry and what is not, and I question very much whether that would accomplish a great deal.

Dr. Kirk.—If I understand Dr. Truman correctly, he reasons that this increase in the advertising dental parlors, which came after the creation of the State boards, is because of the establishment of the State boards. I cannot see any good reason why the establishment of legal restrictions for the practice of dentistry should create an interest in the business of these dental parlors. There was also another increase,—namely, a tendency of men throughout the country to take up the study of dentistry, and a large multiplication of dental schools. I can see more reason why they were the result of State board creation than the dental parlor, but I do not see any connection between the laws limiting the practice of dentistry and the development of these men who are carrying it on apparently illegally.

Dr. James Truman.—I can see a direct connection. The State law has driven these men to get young men from colleges into their offices, with the result that they have created a certain degree of confidence among the people generally in their establishments which did not exist before. That is directly traceable to the force of law.

Dr. Roberts.—The reason for the increase in advertising dental parlors is the desire to make money and the large amount of unemployed capital seeking investment. The financiers who have money see a scheme for making money; therefore they start in with these dental parlors, and they will do it with any business or any profession they can. It seems unfair to attribute the increase in advertising parlors to the formation of dental examining boards. All the dental examining boards can do, and all they have done, is to say whether those desiring to practise in a State have received a certain amount of education or have the requisite fitness.

Dr. Brubaker.—My reasons for asking the question was simply to get opinions from many members of the society, because it is very evident that commercial dentistry is increasing with enormous rapidity, not only here, but in every city in the State, and the question, therefore, arises, in connection with any kind of control of these people, What are the causes that have led to it? It is impossible to try to treat a disease without knowing the cause. There must be a cause for this condition. I do not know what it is or what the causes may be. Personally I have thought for a long time that it is part and parcel of the general commercial spirit of the age in which we are living. There seems to be a tendency towards the formation of trusts on a small scale, to try to regulate the prices of dental work, and so on. But the “dear public” does not wish to be saved any more physically than it does morally, and, therefore, I do not place much faith in the education of the people. Medical men have tried to educate the people for a long time, but they have not been successful, and the dental people will find very much the same thing. Other causes are at work, and unless they are eradicated it will increase. Naturally, therefore, I was somewhat curious to know what causes have combined to produce the present condition. I know this, and probably everybody else does, that there is a bait held out every year for a certain number of graduates of dental colleges to enter these establishments. They are being organized rapidly and offer fairly good wages, and they solicit men to go into their establishments. Young men having the commercial spirit well developed or inherited take up the work. That does not account for the existence of the parlors.

Dr. Curry.—Having been asked what I mean by “organized attack,” I would say, that is a question which I have come here to ask rather than to answer, and inasmuch as I have declared at the start that my contribution was not a paper, I did not bring any remedy, but would say this: We are taught in the colleges that the aim of the college is to educate the man, and it is necessary that he be educated if the public is to be protected, for he will serve the public, and unless he is well educated he serves them ill. That being the case, why cannot the law which authorizes colleges and compels students to take the course of study prescribed by them before they are granted a diploma go one step farther and make the dental college responsible for the professional conduct of graduates after they have left the institution? If a lawyer goes into any

“shyster” business, and shows himself unprincipled or unskilled, his commission is taken from him and he cannot practise law. Now, you could get at this by compelling every operator in every bogus college, school, or institution to have his diploma before his chair, in plain sight; then if there is any question about the man’s ability or his principles, the college which graduated that man can be informed of it and his diploma can be revoked, if necessary legislation were enacted. In reference to the argument against prosecutions, that same principle could be applied to the State examining boards. I know the men who graduate are put to a great deal of trouble and expense to take the State board examinations. If they do not take them they are prosecuted. You might just as well say we could not prosecute them, because they would have the sympathy of the community when such prosecution was brought.

An organized attack could be brought in this way: Each dental society, State board, and college could appoint its corresponding secretary as committeeman to correspond with others and get a consensus of opinion on this question, and then they in turn could request the local boards of education to appoint a lecturer in their schools to lecture to the more advanced classes, and teach them not only in regard to dentistry, but also warn them against taking quack medicines. I think it is too bad that we are so very strenuous on some points,—for instance, in the matter of food products,—when, on the other hand, for ten cents any one can without trouble buy enough laudanum or arsenic to send a family to perdition.

Dr. Brubaker asks the reason for the increase in advertising dentists. The question has been answered,—“It pays.” They advertise to make a set of teeth for one dollar and ninety-eight cents. You go to get a set of them, and they bring you a set and say, “We have these for colored people, and we would not want you to take them, but for fifteen dollars we can make you something that is worth while,” and the “dear public” is perfectly willing to be gulled, and goes on to buy something “worth while.” Now, it may be that they do not want to be saved from the hands of these sharks. Yet the duty is ours, none the less; if we are to represent the dental profession with any degree of pride and truth and give it our best work and our best thought, we must bring it up to a certain standard. We cannot shirk the responsibility by saying, “People don’t want to be protected.”

All dentists who have the best interests of their profession at heart should combine and say to patients when they apply for cheap service, "My time is worth more than you can pay for; but in this city we have dental colleges, and you can go to the college which is the nearest to you and even if you have a student to work for you who is not a graduate, you have a man who is under the direction of skilful operators, and you will be honorably dealt with." This question does not affect me personally, as I have enough work to do, all that I can comfortably do, but with the interest of my profession at heart, I want to do all I can to elevate it, and do not wish to be associated in name even with those who are doing all they can to destroy the confidence of the people.

I am afraid I have spoken too long, and am very sorry the discussion of this subject was not taken up more fully.

Adjourned.

OTTO E. INGLIS, D.D.S.,
Editor Academy of Stomatology.

Editorial.

THE CONVENTION PERIOD.

THE passing time has brought us again to the dull season and the reassembling of the various State, interstate, and national conventions. It is somewhat paradoxical that the more inactive the period the greater the activity in dental convocations. The activity is apparently in proportion to the rise in the thermometer, and it is unfortunate that this is so, for the strain of travel and heat, after a long season of physical and mental stress, does not add either to comfort or satisfactory work.

The question is not, however, one of individual comfort, but whether these conventions are adding anything to dental progress. That they are well sustained is evident from the increasing numbers in attendance. This is the most encouraging sign, for numbers mean strength in a certain direction. That these conventions add much to the science of dentistry directly cannot be said. The immense amount of verbiage sent forth by all of them bears ample

testimony to the fact that the scientific grains are not many in the bushels of chaff. This is not, or should not be, a discouraging feature, for this work is the pabulum upon which more thorough scientific labors are nourished. It is the incentive to many young men, and this is being more and more exhibited in increased mental activity, so that the time is certainly not far away when papers to be received at conventions will be required to at least have the flavor of originality in thought and a decided value through investigations. The change in this direction has been marked in the past decade, and the dental profession is beginning to reap the fruits of the long and earnest work of the dental colleges. The change in the product of all associated efforts, whether local, State, or national, is, to the mind that has lived through the various stages of development, full of astonishment, and every year is adding to this. The class of men graduating this year are unquestionably better than it was possible to produce even three years ago. While the curriculum may not have been enlarged, time has been increased, and time is an all-important factor in the development of mind.

This brings up the question, What does the National Association of Dental Faculties purpose to do this year in the matter of an increase to four years? This was alluded to in our last number, but it is essential that the members of that body should be prepared to meet this demand, which will come up in regular order of proceedings. This question has too long been deferred upon various parliamentary pretexts, and must now be met and receive careful consideration with the view, it is hoped, of final adoption. The four years' course is the only means left to relieve the difficulty now presenting at all dental colleges. The curriculum has been enlarged until further extension is impossible within the narrow limit of time now given. Dental colleges have been instituted to make dentists. They are practically making now a sort of hybrid, neither medical nor dental. This is wrong and unjust to all concerned. Give one more year, and the balance will be swerved in the right direction towards the practical. Many men are discovering this for themselves, and are voluntarily taking a four years' course, and those who have watched the result are convinced of the value of the increase of time. If the Association of Faculties acts this year, it requires no prophetic ken to see that before the first decade of the twentieth century shall have passed dentistry

will have been placed on a firmer foundation than at any period in its history.

The fathers—the founders—are rapidly passing away. They have left their impress for good. The present generation of dentists are their superiors in scientific culture, but inferior in that practical ability that makes for true dental progress. The weak places can be strengthened and the new dentistry must be made superior to the old, and this can be accomplished if the remedy be intelligently grasped by those called to meet the question.

The National Dental Association has no such responsibility devolving upon it, but it has an equally important duty,—that of developing right thinking. This national body leads the associated effort of this country. It is composed of delegates from subordinate associations, and, therefore, in one sense is the nerve-centre of the entire organized body. This heavy responsibility should be met by a corresponding elevated ethical standing. Neither the old American nor the present National has been true to professional life and spirit. They have both set the bad example of bartering their proceedings for money, or its equivalent, and thus playing into the hands of the commercial side of dentistry. This has had an important influence in lowering the moral tone of the dental profession and leading it to believe that this traffic is entirely within the laws of professional ethics. Is it a cause of wonder, therefore, that so few know how to distinguish between trade and profession? The moral effect of this lay conception and practice upon dentists has been disastrous. The majority of practitioners to-day have no conception of what is meant by a true professional spirit. The two national associations mentioned are largely responsible for this, and it is time that a different example should be established. This body made a notable move last year in organizing the sections on a more scientific basis, and it is hoped this year will show marked improvement in the papers presented. Another move must be made in the interest of professional standing, and that is to print the proceedings independently of any and all journals. The time is past when these can be sold to the highest bidder. Let the Association be true to what it stands for, and the effect will be manifest in a broader life extending from national to State and from these to local organizations, and eventually to individuals, resulting in a professional spirit worthy the age and the progress made in dentistry in other directions.

While this is being written the Section on Stomatology of the American Medical Association is in session at St. Paul, Minn. This body stands for all that this article claims. There may be valid objections to it as organized, but not to its true scientific and ethical spirit. It cares nothing for number; indeed, it rather avoids the mob. Its aim is to develop the best in individuals. It does not enter the market-places and expose its work for a bid upon its proceedings. It is, in fact, true to the highest professional idea. While it may not be the best thing to imitate the methods of this body, its spirit is worthy of full acceptance; indeed, without it further progress in the right direction is impossible.

The summer will pass and, possibly, the months to follow may prove the "winter of our discontent," but there is a lingering hope that the united efforts manifest in the next two months may lay, at least, the foundation for a dentistry broad in its culture, generous in its spirit, and effective in its work.

AMERICAN MEDICAL ASSOCIATION, SECTION ON STOMATOLOGY.

THE American Medical Association convened at St. Paul, Minn., June 4, 5, 6, and 7, and from reports the Section on Stomatology was an unqualified success both as to numbers, quality of papers, and character of discussion. The work of this organization has always been of a high order and free from some of the objectionable features of other national bodies.

There will be presented upon the pages of this journal, until completed, full abstracts of all papers read at this meeting, together with the discussions. Several of the papers are given in the present number, together with an abstract of President Andrews's address, which forcibly outlines the true scientific and professional spirit governing this energetic branch of the great national medical organization.

Bibliography.

DENTAL ELECTRICITY. By Levitt E. Custer, B.S., D.D.S., Lecturer upon Dental Electricity in Ohio College of Dental Surgery; Member of Röntgen Society of the United States, etc. Over two hundred illustrations. U. B. Publishing House, Dayton, Ohio, 1901.

This work on dental electricity does not seem appropriately named, as it gives the idea that the subject-matter of the book is confined to electrical apparatus necessary in dental operations, whereas it covers the most important facts in electrical science, and that in such a clear and comprehensive manner that it has impressed the reviewer as being one of the most satisfactory works for the dentist yet published.

The author says in his very brief preface, "Up to this time there is no single work to which the dentist might refer for information upon the electrical questions with which he has to deal without going over much that is foreign to the subject. . . . The author does not presume to present anything new upon the fundamental subjects, the nature of electricity, magnetism, etc., but rather in as concise a manner as possible to put them before the reader as a *résumé*. All technical terms are avoided save a few, without which even a cursory study of electricity would be wanting."

The latter fact furnishes the key that explains the value of the book for the unlearned in the science. It is, chapter by chapter, easily understood; indeed, becomes absorbingly interesting. While it is true that a third of the book is taken up with the elementary facts in electricity, yet these are treated in such a lucid manner, and so free from general technicalities, that the subject seems to assume a new and more vivid character. The author here shows the true teacher, the man of large experience in training others. The individual who writes without this almost invariably overloads his subject with technical terms, which not only obscure his meaning, but place an insurmountable barrier to the comprehension of the subject. Dr. Custer has happily avoided this, and hence

his work is peculiarly well adapted to the minds it is supposed to educate.

The dentist of the present era has been thrust, as it were, into the midst of new conditions without the possibility of securing the necessary training to meet these properly. The introduction of electricity as a motive force has been so recent and so overwhelmingly rapid that the dental operator has been crushed by methods, terms, and appliances, with no possibility of securing a schooling that would fit him to understand the first, or skill, to the limit of safety, in the use of the latter.

The dental colleges of this country have, with very few exceptions, no regular study of this important science. The curriculum is now so overcrowded that teachers are unable to find room for anything further, and yet it is clearly evident that the management of the electric current must be understood if the dentistry of the future is to be properly regulated.

The older class of dental practitioners will be impressed, upon reading this book, with the wonderful progress made in the past few years in the invention of electrical dental appliances. Many of the methods of the past are now practically obsolete. The foot-power dental engine, the old-time furnace for porcelain, the annealing of gold, the drying of cavities, and a multitude of minor applications make the present period, as he reads, seem like the realization of something long hoped for but deemed impossible of attainment.

In view of the necessities of the dentist books have been prepared upon this science, but this one seems to meet more perfectly a general want, and, doubtless, will be used as a text-book in dental colleges and for constant reference by the general dental practitioner.

The book has been read, from cover to cover, with so much pleasure that it seems almost ungracious to allude to a small but positive defect, especially as the author has good ground for an expression of indignation. He states that his oven was patented to protect "the users . . . against rascally competition." Again, on the same subject, he speaks of one being "called to time." Further than this his personal allusions not only show temper, but will fail to strengthen the author's side of the argument, which, for those who know the facts, requires no doubtful support.

The dentist who follows the author carefully cannot fail to have

made himself familiar with the foundation principles of electrical science, and no one not thus familiar has any warrant to make use of methods depending on the electric current, which when used understandingly is most efficient, but when used ignorantly may become dangerous.

The reviewer feels that the dental profession is under peculiar obligations to Dr. Custer, not only for his many inventions, but that he has given to dentistry his valuable experience in a permanent form. Those who may question the possibility of a dentist being an authority on this subject may be enlightened by knowing that the author has supplemented years of study by establishing an independent electrical plant to perfect his various appliances. He is recognized as an authority in electrical science, and his statements are to be accepted, therefore, with entire confidence.

A large sale is anticipated for this book, for the dentist of the future must use the electric current in some form. Every one, therefore, should be prepared to meet the changes that are already upon us, and which make a theoretical knowledge of electrical science an absolute necessity.

The general make-up of the book is exceptionally good, reflecting great credit on the U. B. Publishing House, Dayton, Ohio.

Miscellany.

THE TEETH IN PREGNANCY.—In a paper published in *Obstetrics* for January, 1901, Dr. E. S. Talbot, of Chicago, used the following language:

“The old medical axiom, ‘a tooth for a baby,’ indicates that decay of the teeth during pregnancy has been almost universal in time and place. Decay not only takes place in new localities, but rapid disintegration about new fillings is very common. The teeth are sensitive, and so soft that they can be cut like chalk. The decay creates an appearance of horn or cartilage, showing the tooth is deprived of its lime-salts by a process similar to osteomalacia in bone.”

On being questioned as to his belief in the absorption of the bone matter of the teeth during pregnancy, he claimed that he

spoke of the absorption of the alveolar process and not of the teeth, and then said, "The teeth are never absorbed under such circumstances. Decay takes place from the two causes suggested, —want of vitality and autointoxication. If the teeth are kept clean, there would be no decay during pregnancy."

[We fail to see how a want of vitality or autointoxication can be causes of dental caries.—J. A. McC.]

FUSIBLE METAL FOR ARTICULATING MODELS.—Take a plaster impression of the teeth which are to articulate with the denture to be constructed. The cusps and over-bite of the anterior teeth are all that is really required in the articulating model. Such an impression can be removed without fracture in all ordinary cases. Should fracture occur, the parts can be replaced and held with a little moulding. If the teeth are isolated, it will be necessary to connect the imprints in the impression by grooves cut in the plaster, or by adding mouldine, so as to enable the fusible metal to unite them when the model is poured.

There is no need to wait for the impression to dry out. Hold the impression a few seconds in a Bunsen flame, and it is ready to receive the metal. Pour the metal when of the consistency of a stiff batter. In this state it can be built up until the model is quite thick. Pour and dip in water and separate. Ragged edges may be trimmed with a hot spatula. Five minutes is sufficient time for the entire procedure.—H. C. WETMORE, *Dominion Dental Journal*.

[The saving of time and the hardness of the model are evident advantages in the above method.—J. A. McC.]

REPLACING OLD RUBBER WITH NEW IN RUBBER AND CELLULOID DENTURES.—If the plate be a broken one, fasten the two parts in exact apposition with adhesive wax, run plaster in it, and flask up as for vulcanizing. Separate the flask and remove the plate from the flask and the teeth from the plate. Replace each tooth in its matrix. Pack with rubber as though it were a new case, vulcanize, and finish.

It will sometimes happen that, in repairing sets of this kind, there is such an overhanging gum that when the attempt is made

to remove the plate from the plaster model the whole front part of this is broken away, rendering the model imperfect or perhaps useless. In such a case take a fine saw and cut off the gum in such a way as to leave no overhanging gum when the piece cut away is removed. The sawed part of the plate is then replaced and secured to the other part of the plate with wax. If the gum part of the plate be so thin as to be easily broken off with the fingers, they can be more accurately replaced than when the saw is used. After waxing the parts together, pour plaster in the plate and proceed as before.

The different parts of the plate can be removed from the plaster model without any danger of mutilation of the model.—T. F. CHUPEIN, *Dental Office and Laboratory*.

TESTING FOR DISEASE OF THE ANTRUM WITH A TUNING-FORK.—The *Medical Record* gives the following from the *Laryngoscope*: D. A. Kuyk regards the tuning-fork as a possible test for determining the presence of pus in the antrum, especially in those cases in which the usual diagnostic methods fail to give definite results. The stem of the fork should be applied, after vibration is set up, over the first or second molar. If the antra are free and clear, the tuning-fork will be heard with equal clearness on both sides and for a like duration. If one antrum contain fluid, the fork will not be heard so distinctly, perhaps very faintly, perhaps not at all,—as occurred in one case,—but, if the opposite antrum is free, the patient replies quickly and positively in the affirmative. Given another case where the symptoms are obscure, but in which transillumination gives a shadow on the left side and none on the right, with subjective symptoms inclining one to suspect disease of the left side, the tuning-fork placed on the left side will be heard louder and longer than on the right; the natural deduction will be that the left antral wall is thicker than the right, favoring thereby the better sound transmission, and thus almost conclusively eliminating this cavity as the offending structure. Such proved to be the case.

TO REMOVE TEETH FROM RUBBER PLATES.—The journals have, from time to time, offered many suggestions for this purpose. The

only suggestion which we have found in part effective has been one by Dr. Genese, of Baltimore. He advises that the plate containing the teeth be placed in a saucepan and covered with glycerin, and this set over a Bunsen burner to boil. This, from the temperature it takes to boil the glycerin, will so soften the rubber that the teeth may be removed from the plate perfectly clean. But although we have tried the plan, we have not found it to be entirely effective. There will be particles of rubber clinging to the pins and next to the shoulder of each tooth. This can be removed by taking the tooth from the boiling glycerin and holding it in a rag, doubled several times, when the adhering particles of rubber around the pins may be removed with a fine excavator, for the rubber is quite softened by the heat of the boiling glycerin, and manipulated in this way gives less trouble to remove than any other way that we have tried.

The plan which we have found to leave teeth and pins absolutely free from all adhering rubber is to place the old plate in a sand-bath. This may be done in a clean ladle placed over a Bunsen burner in the chimney. The rubber will be all burnt off, while the odor of burning rubber, which is anything but pleasant, escapes up the chimney. When the rubber is all burnt off there will be a powdery residue around the pins which is readily brushed off with a stiff bench-brush.—T. F. CHUPEIN, *Dental Office and Laboratory*.

AN IMPROVISED MATRIX.—At a clinic given at the Ohio State Dental Society, Dr. H. M. Semans, of Columbus, demonstrated his method of adapting a simple matrix about a badly decayed lower first molar whose lingual wall was broken entirely away. The matrix of desirable thickness is cut to conform to the gum margin and bent to fit the tooth. The ends are allowed to pass a short distance beyond the remaining mesial and distal walls. A hole is punched in each end of the matrix near the gum border. One end of a thread is passed through these holes, the matrix is placed in position, and the thread is stepped over the buccal wall and forced well down on the mesial and distal sides. After tying a surgeon's knot, the ends of the thread may then be wrapped about the matrix and tooth as much as desired to secure rigidity. Rubber dam, cotton, or napkins may then be used to suit the case or

the desire of the operator. A matrix put on in this way may be retained in the mouth a number of days with no discomfort to the patient.—*Dental Register*.

[In the report of this clinic no mention is made of the material out of which the matrix was formed. The writer has used a matrix in the same manner made of sheet copper of about gauge 35, B. and S. When it is annealed, it is very pliable and can be contoured.]

MICROBIC ASSOCIATION.—The *Peoria Medical Journal* quotes the following from Rogers, "Introduction of Medicine:"

Here is an experimental fact which is of a character to bring home the interest and importance of microbic association.

Take a culture of *bacillus prodigiosus*, a simple saprophyte, remarkable only for the beautiful red colors it gives the medium in which it develops; inject a few drops of it beneath the skin of a rabbit; no trouble whatever results. Then take a culture of *symp-tomatic anthrax*, an anaërobic bacillus which produces in certain animals a gaseous gangrene. The rabbit enjoys a natural immunity against this microbe, of which it can receive injections with impunity. Here, then, are two bacteria, both harmless to the rabbit.

Take now a third rabbit. Inject into it a mixture of the two cultures. Gaseous gangrene will develop and entail a speedy death. Thus two microbes which, taken separately, are harmless, occasion a deadly disease when they are united. In this instance the microbe which favors the infection—the *bacillus prodigiosus*—acts by a soluble substance, which glycerin dissolves and alcohol precipitates, which resists a temperature of 120° F., and which, by all these characteristics, resembles peptotoxin. One drop of this injected into the veins of a rabbit of two thousand grammes' weight is sufficient to abolish its natural immunity.

REFITTING DENTURES WITH OXYPHOSPHATE OF COPPER.—At the eighth annual clinic of the Alumni Association of the Chicago College of Dental Surgery, Dr. Ames demonstrated the possibility of refitting dentures by simply placing new process oxyphosphate of copper, mixed to a stiff creamy state, upon the defective surface

and pressing accurately to place, and then allowing the cement to set in contact with the tissues.

"This refit," the doctor says, "will apply to cases in which a plate has been made soon after extraction, those in which the tissues have become flabby and yielding, as well as those entire dentures in which a leak in the periphery easily admits air beneath the plate."—R. C. BROPHY, *The Bur.*

Obituary.

WILLIAM HENRY MORGAN, M.D., D.D.S.

THE death of this distinguished member of the dental profession was briefly noticed in the last number of this journal. His death occurred on Thursday, May 16, 1901, after a long period of failing health, to which was added the feebleness of an advanced age,—eighty-three years.

Dr. Morgan was born in Logan County, Ky., February 23, 1818, and was the son of Joseph and Elizabeth Morgan. His father was a veteran of the war of 1812, having fought under General Jackson at the battle of New Orleans, and his grandfather was a colonel in the Revolutionary War.

The subject of this sketch early established a taste for literary work, and gave a large portion of his scanty earnings on the farm to the purchase of books. His early experiences in farm life gave him but limited opportunities for educational advantages, but his tastes and determined character overcame all obstacles, and he became distinguished in the various positions he was called to fill during his long life.

He graduated from the Baltimore College of Dental Surgery in 1848. He practised dentistry for one year in Russellville, Ky., and then removed to Nashville, Tenn., where he entered into partnership with Dr. T. B. Hamlin. These two were the only practitioners in Tennessee who had, at this time, graduated from a dental college. This partnership continued for ten years.

Dr. Morgan was elected, in 1865, a member of the Board of Trustees of the Ohio College of Dental Surgery, and at a later

period was elected its president, which position he resigned in 1879 to accept the chair of Clinical Dentistry and Dental Pathology in Vanderbilt University. The Department of Dentistry of this University was organized by him, and he held the position of dean until his advanced age compelled him to give up the work. Dr. Morgan's reputation extended beyond the confines of his State and neighboring States, and became national. He assisted in organizing the American Dental Association in 1860, and was twice elected to its presidency, the only man at that time thus honored.

He was during a long period a trustee of the Meharry Medical College, and took a deep interest in the education of the colored youth in that institution, especially in the department of Dentistry. He was president, at times, of various dental organizations.

During President Cleveland's administration Dr. Morgan was appointed a member of the Indian Commission, and continued in that service under a portion of President Harrison's administration.

Dr. Morgan was active in religious matters, having early joined the Methodist Church. He was for years superintendent of the Sunday-school connected with his church, and frequently a delegate to the annual Conference and to the General Conference. For thirty years he was a member of the Book Committee of the Methodist Episcopal Church South.

Dr. Morgan ranked high in Freemasonry, being a member of the Scottish Rite, and served for many years as Prelate of the Nashville Commandery, Knights Templar.

While this many-sided life is interesting, as all such lives are, the details that necessarily made it of great value must, even if known, be omitted. Dr. Morgan was true to his own conceptions of duty. He marked out his course of life when very young, and followed it to the end. He had no narrow ambition contracted within religious, political, or State lines, but, grasping the necessities of all classes, he became a strength to the humble and a constant source of inspiration to those more advanced.

His work in his profession was not so much in its literature as it was in practical efforts to influence others through organized effort. As already stated, his ability as a debater and parliamentarian made him efficient in the various positions upon the floor or in the chair. No one was listened to with more respect than he in the discussions upon scientific questions arising in the national

body. His mind was a storehouse of facts of observation, upon which he was able to draw to vividly illustrate his subject.

He was not able to be present at the closing meeting of the American Dental Association, which he had so long honored by his presence and co-operation, but his interest was manifested in his messages to his friends.

He was almost the last of that brilliant coterie of men who opened up the last half of the nineteenth century and were active in the renaissance of dentistry at that period. He was contemporary with Harris, Townsend, White, Westcott, Arthur, Taft, Rich, McKellops, and a host of others.

To the writer Dr. Morgan's life and work were ever an inspiring force. He was to him always a guide in those things that make for progress, and now that he has passed from earthly activities, there seems a void that we may look in vain to fill. In the presence of a life such as this the writer has only the grateful thought that it was his privilege to know and associate with it and to be a partaker of that fine enthusiasm that made Dr. Morgan's life a continual benediction to all who were brought within its influence.

Dr. Morgan was married, in 1852, to Miss Sarah A. Noel, of Kentucky, and was the father of four children,—Mrs. C. H. Noyes, of Warren, Pa., Dr. Henry W. Morgan, J. B. Morgan, and Garrett Morgan.

The funeral took place at the McKendree Church, May 17; interment in Mount Olivet Cemetery, Nashville.

Current News.

THE NATIONAL MEETINGS AT MILWAUKEE.—SPECIAL NOTICE.

THE profession from the Eastern section who expect to attend any or all of the national meetings at Milwaukee in August are requested to at once send their names to Dr. H. J. Burkhart, of Batavia, N. Y. It is expected that a rate war between the railroads will be on at that time, of which advantage will be taken. An arrangement can be made for a stop of several days at the Pan-American Exposition, at Buffalo, on the return trip.

NATIONAL DENTAL ASSOCIATION.

THE fourth annual meeting of the National Dental Association will be held in Milwaukee, Wis., commencing Tuesday, August 6, and continuing four days. The Masonic Temple hall, which is conveniently located and especially suited to the various needs of the Association, has been secured. Special railroad rates are being secured and will be announced later.

All regularly organized dental associations are entitled to one delegate for each ten members, and these associations are urged to send full delegations.

Dr. G. V. I. Brown, of Milwaukee, chairman of the local committee, will engage rooms at the hotels and answer questions regarding local arrangements.

G. V. BLACK,
President.

J. D. PATTERSON,
Chairman Executive Committee.

A. H. PECK,
Secretary.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE nineteenth annual session of the National Association of Dental Examiners will be held at the Plankinton Hotel, Milwaukee, Wis., beginning Friday, August 2, and continuing in session until adjournment. The hotel rates will be, American plan, without bath, \$2.50 to \$4.50 per day; with bath, \$3.50 to \$5 per day. A fare of one and one-third has been arranged for on the Lehigh Valley Railroad, good from July 31 to August 10, inclusive, \$26.07 for the round trip. Trains leave New York at eight A.M., ten A.M., and twelve M.; leave Philadelphia, nine A.M., 10.30 A.M., and 12.30 P.M., connecting at South Bethlehem with main line; arrive at Buffalo, 9.20 P.M., 9.35 P.M., and 9.55 P.M., in time for connection with Chicago Express leaving at ten P.M.; arrive at Chicago next day, 1.28; leave Chicago at three P.M., and arrive at Milwaukee five P.M. Buy single through ticket and take agent's receipt.

CHARLES A. MEEKER, D.D.S.,
Secretary.

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Original Communications.¹

THE APPLICATION OF ELECTROMETALLURGY IN
DENTAL PRACTICE.

BY WM. LEON ELLERBECK, PHILADELPHIA.

OF the several metal base-plates which have been employed for artificial dentures, the electrodeposit, so-called galvanoplastic base-plate, is the only one which gives us absolute adaptation to the model. Of this one may well judge when it is considered that a thumb- or finger-mark accidentally left on the carbonized surface of a plaster model prepared for the deposit may be clearly defined on the approximating surface of the metal after the deposition has taken place.

While the electrodeposit silver base, as made by many, has proved unsuccessful to a degree which would practically prohibit its recommendation over plates made of other materials and by other methods, still in the hands of some skilled in the art of electrometallurgy, light, durable, and generally satisfactory plates have been produced. It is but natural, then, that the query arise as to whether the method or the man is most at fault, in the general discontinuance of this base, which, while applicable to all

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

cases where the mere question of supplying artificial teeth is concerned, is strongly indicated in at least two classes of mouths which may present.

First, where the roof of the mouth is broad and flat and excessive alveolar absorption has taken place. Here the utmost possibilities for securing the necessary perfect adhesion to insure retention of the denture are obtainable in the electrodeposit base.

Secondly, in mouths with a high contracted arch and deeply undercut alveolar ridges—such a case as would involve great difficulty in the swaging process—the deposit plate may be made with comparative ease, the only difficulties being those met with in the proper management of the electric current and the plating solution. The chief objections to the electrodeposit silver base are the occasional weakness due to porosity of the metal where the plating has been unskilfully performed,—and in addition its tendency to discolor through the action of the sulphides of the mouth,—and because of the difficulty in keeping the sulphur of the rubber used for attachment from combining chemically with the silver.

While it is easily possible for most practitioners to allot a small part of their laboratory for the necessary batteries and plating solutions and give the time and attention necessary for successful results, still, just because of this necessity for very careful observation of detail, it is hardly probable that the busy practitioner will ever take up this method and make it a feature of his general work. There is, however, nothing impracticable in its employment by the prosthetic dentist who makes a specialty of working for the profession; on the contrary, the fact that a great many plates may be made at one time should appeal to him, especially if the objections cited could be largely or wholly overcome. With a view of stimulating further experimentation by those experimentally inclined, I give the general directions to follow in procuring the silver base, and trust that the few suggestions which I make may be of value in leading to the perfection of this method, which I feel has not been given the scientific attention which it seems to merit and which if perfected would be of considerable importance in dental prosthesis.

Having obtained in the usual manner an accurate impression of the mouth to be fitted, a model is run and trimmed as if a vulcanite plate were to be made. The air-chamber may be made of thin sheet lead or tin and adjusted to fit tightly against the

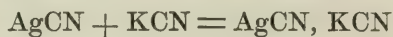
plaster, or it may be made by cutting a shallow chamber in the impression before running the model. The metal chamber is, however, preferable, on account of its having better conducting properties than the carbon.

After having placed the air-chamber in the proper position, a fine groove should be made on the model to show the limiting line or margin of the plate. If any uncertainty exists as to where it should be allowed to extend, a base plate of wax may be made, tried in the mouth, and trimmed until satisfactory, then placed on the model and a line made on the plaster to correspond exactly with the margin of the wax. After this the groove should be made, using the line as an indicator. This line, of course, appears on the plate as a faint ridge, and serves as a guide in trimming the metal to the proper place. A wire, preferably of silver, is passed through the plaster at a place a little distant from where the posterior margin of the plate is to be. It should be bent over the edge of the model and twisted around the main portion of the wire until it is slightly embedded in the plaster.

The model should now be placed in a pot of boiling beeswax until it is thoroughly saturated. A few trials will enable one to tell when it has been soaked enough. The wax penetrates throughout the plaster, making it hard or horny and impervious to moisture, thus preventing it from disintegrating when placed in the depositing solution. It also renders the surface suitable for the reception of the graphite or whatever is used for the conducting coat. After the model has cooled the surface is carbonized with finely powdered graphite, the Ceylon variety being preferable, since it contains a large proportion of carbon and very little silicon and other impurities which would interfere with its conducting properties. The carbon is applied with a camel's-hair brush having a thick body of short hairs. Breathing on the model occasionally facilitates the adhesion. When the surface is perfectly black and bright the excess powder should be blown off, and that which adheres beyond about a sixteenth of an inch from the marginal line should be scraped away. It is necessary to leave this slight excess because there is a tendency for the deposited metal to become granular or nodular along the edges, and the excess admits of a little trimming, so that when the metal is filled to the marginal mark the deposit will be hard and reguline.

To remove any oil or grease that may have gotten on the sur-

face, it is well to pour over the model a dilute solution of potassium hydrate, and then wash well with water. The model thus prepared is ready for the reception of the deposit. There are several solutions which may be used for this purpose, but the best and the one most frequently employed is a solution of argento-potassic cyanide made by dissolving argentic cyanide in potassium cyanide until the right amount of silver is in solution. The reaction which takes place is shown in the following simple equation:

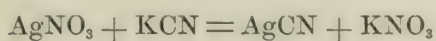


Some free potassium cyanide is added for the purpose of keeping the solution of the desired strength. The carbonized model is used as the cathode or receiving surface, and is consequently attached by the conducting wire to the negative pole of the battery, or whatever is used to supply the current. To the positive pole is attached an anode of pure silver plate, the amount of surface immersed in the solution depending upon the strength of the current necessary to produce a good deposit, and upon the area of the cathodal or receiving surface. When the current is applied silver is deposited, beginning at the junction of the feed-wire and the carbon of the model and spreading gradually over the surface, presenting a beautiful frosty white appearance. The action is allowed to continue until the plate reaches the proper thickness, a slight excess being allowed for dressing. It should then be taken from the solution and thoroughly washed with water to remove any traces of the poisonous potassium cyanide. Here I would suggest that a possible way to overcome any weakness due to porosity would be to subject the plate while still closely adherent to the model to the shot-swaging process, which I believe will make the metal denser and more rigid. The wax-soaked model being less fragile than the unwaxed cast, it is less liable to spread or crack. After swaging, the plate should be removed from the model. To accomplish this first apply a gentle heat until the wax begins to bubble from the plaster, then place a knife-blade under the edge of the metal. The plate can be pried off without difficulty. It should then be trimmed with a file to the marginal line, which corresponds to the depression made in the model. The rough nodular portions should be ground off with a corundum wheel, and the surface of the plate polished to a high degree, using felt wheels and pumice, scratch-brushes, buff-wheels and rouge,

etc. The brighter and better the polish of the silver the greater are the chances for a good gold deposit. After this the plate is placed on a model for support, and is speared with a pointed chisel or gouge, slight elevations being made along the ridge and wherever the rubber is to be attached. It is then ready for the gold bath, in which it should be placed and heavily gilded to prevent chemical action between the silver and the sulphur of the rubber. This done, it is ready for the teeth. From this point proceed in the same way as when making a rubber attachment to a gold plate. After vulcanizing, the piece should be again polished. In this operation some of the gold deposit is removed, and must be replaced to prevent the plate from tarnishing. It is therefore again placed in the gold bath until it receives a good thick deposit. It should be thoroughly washed to remove any traces of potassium cyanide, and then scratch-brushed and highly polished, after which it is ready for the patient.

DEPOSITING SOLUTIONS.

From two to four ounces of silver per gallon are sufficient for silver-coating metallic surfaces, but in order to get the first thin film to deposit on the carbon, a heavier solution is desirable, as it is difficult to start the plating with a weak solution. Ten ounces to the gallon makes a good solution for the purpose, but once the film is made it is transferred to the weak solution, and while more time is required in order to obtain the desired thickness, it is more uniform and tough when once obtained. Having decided upon the amount we wish to make, the process is a simple chemical calculation. If, for example, we wish to make one gallon of the strong solution, ten ounces of silver should be converted into argentic nitrate in the usual manner, dissolved in water, and the silver precipitated out as a cyanide by the addition of potassium cyanide, care being taken not to add any more than just sufficient to precipitate all the metal, as the silver salt is soluble in an excess of this agent. The reaction is as follows:

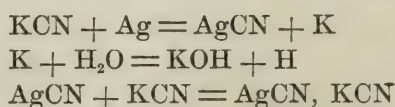


The precipitate is collected on a filter-paper and washed with distilled water to remove any traces of potassium nitrate. It is then dissolved in potassium cyanide, the amount necessary to affect the solution being easily calculated in the following manner:

First determine by simple proportion how much silver cyanide was produced from the silver employed,—107.6 (once the atomic weight of silver) : 133.6 (molecular weight of silver cyanide) :: ten ounces of silver (amount used) : x (weight of silver cyanide produced). Then 133.6 (once the molecular weight of silver cyanide) : 65 (once the molecular weight of potassium cyanide) :: x (amount of silver cyanide) : x 1 (total amount of potassium cyanide necessary to combine with silver cyanide).

The potassic salt is dissolved in distilled water, and to it is added one-half more for free cyanide, the necessity for which will be presently explained. After the silver cyanide is dissolved the solution should be made up to one gallon. It is then ready for use.

Another way to make the solutions where facilities for chemical work are not handy is to calculate the amount of potassium cyanide necessary to make the argento-potassic salt, and add one-half more for free cyanide. Then take a large silver anode and a much smaller silver cathode, the weights of which are known, attach them to the poles of a battery, immerse in the solution, and weigh from time to time. The current should be used as strong as possible without throwing the deposit down as a powder. The silver is dissolved from the anode more rapidly than it is deposited on the cathode. As a consequence the solution grows constantly stronger. This action should be kept up until the difference in weight of the loss of the anode and the increase in weight of the cathode shows the solution to be of the desired strength. The reactions which take place are as follows:



In many instances where there are deep depressions in the model which is to be coated it is difficult to make the deposit spread in these parts. Where such conditions exist, extra guides of fine silver wire should be attached to the main feed and bent so that their ends will rest at the bottom of the depression. This will likely overcome the difficulty.

Where good graphite cannot be obtained, its conducting power may be increased by gilding it. To do this, dissolve one part of gold chloride in one hundred parts of sulphuric ether in a deep

glass vessel, add fifty parts of the powdered graphite, mix them thoroughly, and expose the mixture to the sunlight, stirring it at different intervals until it is dry; it can then be applied in the same manner as the graphite. Where for any reason the silver cannot be made to start directly on the carbon, a thin trace of copper may be deposited, after which the silvering may be readily accomplished, the copper being easily removed by dilute nitric acid after the plate is removed from the model, the gold used in plating filling up the place of the removed copper, though the very fine lines may not be reproduced. A good copper solution may be made by dissolving eight ounces of pure copper sulphate in one part of boiling water, adding one of pure sulphuric acid, and diluting to one quart.

MANAGEMENT OF PLATING SOLUTIONS AND CONTROL OF THE ELECTRICAL CURRENT EMPLOYED IN THE DEPOSITION.

As before mentioned, a good plating solution should contain one equivalent (sixty-five parts) of pure potassium cyanide, one equivalent (133.6 parts) of argentic cyanide, and from thirty to fifty per cent. of free cyanide, with sufficient water to make a thin liquid. It should be remembered that ordinary commercial potassium cyanide is very impure, and the absolute amount of potassium cyanide present varies considerably. This should be taken into account in making depositing solutions, otherwise the proportion will not be at all accurate. If possible the chemically pure cyanide should be employed, because the commercial article contains impurities such as potassium carbonate and potassium chloride, which salts are likely to interfere with the perfect working of the solutions. The German cyanide is to be preferred.

The necessity for having free cyanide arises from the fact that in the working of the solution there is formed at the anode insoluble silver cyanide, and free potassium cyanide is necessary to combine with it and form the soluble double salt. Simultaneously with the formation of this compound at the anode, potassium cyanide and free cyanogen are liberated at the cathode, due to the deposition of the silver. It requires some time for those substances to mix with the liquid and reach the dissolving plate, therefore the extra potassium cyanide is added to allow the deposit to proceed uninterruptedly. It is necessary to have sufficient water to form a thin liquid because the double salt of silver and potassium, being

specifically heavier than the solution, tends to sink to the bottom. On the other hand, the cyanogen and potassium cyanide set free at the cathode, being specifically lighter, tend to rise to the top; at the same time, due to capillarity, these substances tend to diffuse into the surrounding liquid, and the thinner the solution the more mobile are its particles and the more rapidly the diffusion takes place. To prevent the fluid from settling into strata of different densities, it should occasionally be stirred.

There have been several theories advanced to explain the phenomena of electrolysis. One which appears plausible is the polarization of molecules, which is that when the salt is decomposed and the metal liberated, the substance with which it was in combination, being in a nascent state, expresses a stronger affinity for the metal of the molecule next to it than the substance with which it is already combined, and thus an interchange takes place repeated through a direct chain of molecules, the liberated substance of the molecule decomposed exerting a like influence upon the succeeding one until the anode is reached, where, the same nascent condition prevailing, the substance attacks it and becomes satisfied. The solution should be stirred frequently to insure homogeneity of the liquid, also occasionally filtered to remove extraneous particles held in suspension. That there is a necessity for frequent stirring because of a tendency to the formation of different strata of different densities may be easily determined after the solution has been used for some time without being disturbed. Immerse near the surface a piece of metal to which is attached a wire, and immerse in the lower portion another piece of the same metal, then attach the wires to a galvanometer. The needle is deflected. This is brought about by the electrical current produced by the action of one metal in two liquids. It goes to show the difference in composition of different portions of the depositing solution. A practical demonstration of this occurs at a time when the battery for some reason becomes suddenly weak. The silver deposited upon the model will be redissolved and deposited back on the anode. This is brought about by the liquids surrounding the anode having, through long continued use, become saturated with silver and that about the cathode having become full of free cyanide. The two electrodes form a voltaic battery (one metal in two liquids), and send a current opposite in direction to that supplied by the battery used in de-

positing. The electrical current used in small operations, such as would be required in the dental laboratory, is supplied by voltaic cells such as Smee's or Bunsen's, but for large operations where a considerable amount of work is done, as in electroplating establishments, the magneto-electric machines are employed, they being more uniform in action and necessary to insure uniform results. Much depends upon the control of the current. If the metal is deposited upon the feed-wire as a grayish-brown powder, and does not extend to the model, the blackleading is likely imperfect. If, however, it extends to the model and is still brown and powdery, it shows that the current is too strong. The following simple experiment will show what is necessary to control the current in order to obtain good results:

Connect one pole of the battery to one of the terminals of the galvanometer; to the other terminal attach the wire having the silver plate. See that the galvanometer points to zero, then immerse the silver strips a few inches apart. Observe that the deflection is decreased by increasing the distance between the strips, and increased by bringing them closer together. Observe that the deflection is decreased by lessening the amount of metal immersed; either pole or both. The same results may be obtained by lessening the extent of immersion of the different materials used in the battery solution. Again, substitute for a part of the silver wire a small piece of German silver. Notice that the resistance is greater and that the needle is not deflected to such an extent as with silver alone. Having these few facts in mind, the operator should be able to control the current perfectly.

Generally speaking, the area of the anodal surface should be equal to the area of the cathode, the number of plates being made at one time gauging the size of the silver plate, the strength of the current, of course, modifying this some.

The gold-plating solution may be made in the same manner as the silver bath, of course using the cyanide of gold in place of the silver salt, and where the battery method is employed using a gold cathode in place of silver. Gold solutions should contain about one ounce of the metal to the gallon, and should be used at a temperature ranging from 90° to 130° F., with a current of two cells.

Should the plates at any time become tarnished in the mouth, they may be readily regilded.

URIC ACID IN ITS RELATION TO DISEASE, WITH SPECIAL REFERENCE TO THE DISEASES OF THE ORAL CAVITY.¹

BY J. C. BIERWIRTH, M.D., BROOKLYN, N. Y.

IN selecting the above caption for this paper, the writer wishes to state, at the outset, that this is done for brevity chiefly, as it does not express the scope intended; for to treat of uric acid and all the diseases it is supposed to cause in the short time at our disposal is an impossibility, and we will therefore have to content ourselves with a brief and sketchy outline only, so as to introduce the subject for a general discussion.

For several years the writer has been impressed with the widely prevalent functional disturbances and organic diseases traceable to a faulty elimination of the products of tissue waste. Many works have been written on the two most prevalent diseases belonging to this group,—namely, rheumatism and gout,—and many theories have been advanced as to their causes, but in most text-books very little can be found which would throw any light upon the more obscure functional disturbances of the various organs of the body resulting from autointoxication. With the ever-increasing knowledge of the chemistry of the body, we are enabled now to recognize many disease processes as being due to autoinfection, or, to speak more correctly, being endogenetic,—*i.e.*, produced within the body, and not due to some obscure outside cause. Viewed from this stand-point many diseases have become clear to us, and we are enabled to treat them intelligently. The writer has given much thought and study for the past eight or ten years to the diseases under consideration, he is convinced of the correctness of the above expressed opinion, and it has been a source of much gratification to prove clinically the results of the laboratory experiments. The more we think of the endogenetic causes, as factors in the production of disease, the better will we be able to diagnosticate and treat successfully hitherto but little understood functional disturbances and organic diseases.

In order to better understand the subject, it will be necessary to review briefly the chemistry of the various products of tissue

¹ Read before The New York Institute of Stomatology, April 2, 1901.

waste from their probable source to the final compounds as they appear in the urine. We cannot entirely subscribe to this statement of Purdy: "The variations in nutrition and waste are accurately recorded in the urine, hour by hour and by an intelligent interpretation of modern methods of urine analysis these physiological tides may now be read as accurately as we can number the pulsations of the heart." It is no doubt true that the variations in nutrition and waste are accurately recorded in the urine, but physiological chemistry has thus far not sufficiently advanced to enable us to interpret with accuracy either the physiological or pathological tides of nutrition. So long as we are unable to follow with accuracy the various chemical processes, from the food as it enters the stomach, through its complex steps of digestion and assimilation, and final deposit in the tissues, to the ultimate use these tissues make of it, and then on to the final products of waste as found in the urine, so long will our conclusions based upon an analysis of the urine be shrouded in doubt, our diagnosis and prognosis be open to question, and our treatment be largely empirical. But, although our knowledge is not as mathematically correct as Purdy would lead us to believe, we can do a great deal with what we have, and we may hope that the near future may bring such a utopian state as the above quotation indicates.

Nearly the entire product of tissue waste of the body is excreted by the kidneys in the form of urea, uric acid, xanthine, hypoxanthine, creatin, creatinin, and the compounds of oxalic acid. Of these, urea represents about ninety per cent, the remaining ten per cent. being divided among the other compounds. They all belong to a group classed as nitrogenous compounds, and are all correlated chemically.

Urea, of the formula $\text{CH}_4\text{N}_2\text{O}$, is the most important, by virtue of its greater quantity. It is derived chiefly from the general tissue waste, and to some extent from the unassimilated nitrogenous food. The liver is now considered the chief laboratory for the formation of urea, with perhaps some aid from the spleen. Clinically this is proved by a considerable increase above normal in diabetes mellitus, in which disease the liver is stimulated to increased action, while in all diseases of the liver, resulting in diminished action of that organ, urea is markedly decreased. The daily amount excreted is variously stated to be from three hundred to six hundred grains in a healthy adult; occupation, sex,

and age produce, however, wide variations within the limits of health.

Uric acid, having the chemical formula of $C_5H_4N_4O_3$, is constantly present in the urine, but only in very small amounts. Most works on urinalysis state the daily amount to be from eight to twelve grains, but more recent investigations, with the aid of perfected methods, give the amount as from twenty to thirty grains. It is chiefly excreted in combination with several of the elements, notably sodium, as neutral and acid urates. It is to the presence of the acid sodium urate that the urine owes its acidity, and not to uric acid, as is not infrequently believed. The fact that crystals of uric acid are deposited in urines upon standing is no proof that it is present in excess. These crystals are the result of the splitting up of the urates through the so-called acid fermentation by the aid of the mucus present. Uric acid is but slightly soluble in cold water, the proportion being 1 to 15,000, hence it appears in the urine chiefly in the form of the soluble neutral urates, by combining with the various salts in the blood. The acid sodium urate is only sparingly soluble, and is therefore present in only small amounts. Uric acid, like urea, is chiefly formed in the liver, and like it is the result of tissue waste. In the normal state the blood only contains the faintest trace, but in gout and rheumatism the proportion is said to become quite appreciable. It is assumed that uric acid, after its formation in the liver, combines at once with sodium, potassium, and ammonium, and forms neutral salts with these bases, which then are carried by the blood-current to the kidneys for excretion. The acid urates, also called biurates, are found in gouty and rheumatic deposits about the joints. By a further grouping of molecules we get another class of compounds, called quadrurates. These are much more soluble than the biurates, and no doubt exist in the blood. By some of the more recent investigators it is believed that the normal existence of uric acid in the blood is in the form of quadrurates. Roberts considers that all pathological phenomena usually ascribed to uric acid are due to secondary changes in these urates. He has carefully investigated the solubility of the acid urates, notably the sodium urate, in cold water impregnated with various salts, and has tabulated his results in an interesting manner. This solubility of the acid urates has an important bearing upon the treatment of the various disorders due to retained

excrementitious materials. Ralph, in his "Practical Treatise on Diseases of the Kidneys," has tabulated the solubility of the urates in cold water as follows: Potassium, acid 1 to 800, neutral 1 to 44; sodium, acid 1 to 1200, neutral 1 to 77; lithium, acid 1 to 60; calcium, acid 1 to 600, neutral 1 to 1500; ammonium, acid 1 to 1600. It is interesting to note from these figures the great solubility of the acid lithium urate, it being 1 to 60, as compared to the feeble solubility of the potassium and sodium urates of 1 to 800 and 1 to 1200 respectively. This greater solubility of the lithium urate has an important bearing upon the treatment of gout and rheumatism, and the therapeutic results obtained from the various lithium salts have amply proved the laboratory results. It will be of interest here to note the probable chemistry of gout and rheumatism. As already stated, uric acid after its formation in the liver, probably at once combines with the alkaline carbonates in the blood, forming the soluble quadrurates, which pass into the blood-current and are excreted by the kidneys. In perfect health this process is carried on with sufficient promptness to prevent detention and accumulation in the blood. But in persons prone to attacks of gout or rheumatism, either from an excessive production of uric acid or a diminished action of the kidneys, or both, the quadrurates accumulate in the blood. This detention results in their transformation into biurates or acid urates, which, being feebly soluble, are soon deposited in various parts of the body and produce the symptoms of gout and rheumatism. It would of course be an assumption to claim that this is all there is to the chemistry of the diseases under consideration; far from it. There are many links yet missing to complete the chain of proof, but in the main the above outline seems to point the way which may lead to the discovery of the true cause. It will now be proper to ask, what causes this faulty chemistry which leads up to a state of disease? Among the investigators of this class of diseases many divers opinions have been expressed. Some claim that they can be explained entirely from the chemical stand-point; others disregard this, and claim that they are due to bacterial infection, and the number in this class seems to be growing every year. To the writer it seems that there can be no doubt that the cause lies somewhere in the gastrointestinal tract; whether a hyperacidity of the stomach of long standing due to nervous causes or chronic indigestion, or both, or whether a bacterial infection in the

intestines, causing the production of putrefactive gases, which, being absorbed by the blood-current, disturb the normal chemistry, or whether other yet unknown bacteria in the intestines act as specific causes, are questions which the future will solve, no doubt. When we try to explain a case of acute inflammatory rheumatism on the purely chemical theory, it would seem that something is lacking, and that some more specific cause must exist, which some of the adherents to the bacterial theory seem to have found in the *bacillus coli communis*.

Creatin and *creatinin* are two interchangeable bodies, and are represented in the urine chiefly by the latter, which is an anhydride of the former. Creatinin is a constant constituent of normal urine, and varies in amount from 0.5 grain to five grains, according to the amount of proteid substances ingested. It is of interest here to note that one investigator has recently claimed to have produced an arteriosclerosis in animals by feeding to them large quantities of creatinin, and, arguing from this, is of the opinion that this body is largely responsible for a like condition of the arteries in man.

Xanthine and *hypoxanthine* are of interest, in the present consideration of the subject, only from the fact that they are in reality uric acid less highly organized, having one and two atoms of oxygen less respectively. The formula of xanthine is $C_5H_4N_4O_2$, and that of hypoxanthine is $C_5H_4N_4O$. But little is known of their physiological or pathological effects in the human economy. Some recent observers are of the opinion that, owing to a faulty action of the liver, uric acid passes into the circulation in the less organized form of these two bodies, which, when in excess, act as poisonous.

Oxalic acid and its salts have an important bearing on many functional disturbances, and their probable chemistry is of special importance in this connection. Oxalic acid is very largely introduced into the system through the vegetable foods, especially rhubarb, tomatoes, cabbage, spinach, asparagus, etc. In the laboratory of the liver it is readily split up into CO_2 and H_2 , its chemical formula being $C_2H_2O_4$, which would make $2CO_2 + H_2$. Were this not so, the majority of vegetables would act as poisonous, for oxalic acid is one of the most corrosive poisons known. When the digestive functions are carried on normally, the greater portion is split up as shown, and what remains forms a salt with the calcium, and is

excreted by the kidneys as calcium oxalate, but when disturbances of digestion occur and the latter is found in the urine in excess, then symptoms of poisoning may be manifest. Oxalate of lime is kept in solution in the urine by the acid sodium phosphate, when present in normal amount, but when present in excess is crystallized out, owing to its insolubility in water; it is freely soluble, however, in hydrochloric and nitric acid. The mere presence of an excess of crystals of oxalate of lime in the urine is of necessity no evidence of a pathological condition, for they are readily formed, during the process of fermentation, by a splitting up of uric acid and urates. It is also perfectly consistent with health when we find them in freshly voided urine of persons who have eaten largely of vegetables rich in oxalic acid. But when we have a specimen of urine which, being protected from fermentation, deposits large quantities of urates, uric acid *and* oxalate of lime, we are justified in considering it pathological, and in applying this knowledge in the treatment of our patients.

If we now turn to the clinical picture, which presents itself to us as the result of this faulty chemistry and the endogenetic diseases caused thereby, we find that it includes almost every organ and system in the body, and shows so varied an aspect in its symptomatology that it seems impossible to give even an outline tracing of it here. The terms uric acid diathesis, lithæmia, oxaluria, gouty and rheumatic diathesis, etc., have all been employed by various writers to designate the ever varying group of symptoms under consideration. These disturbances of health are rarely found in children or young adults, except in families with marked hereditary tendencies, and are mostly met with in persons past thirty-five years of age. Males are more subject to them than females, except, again, where there is a marked heredity. The nervous system seems to suffer most. Severe and frequent attacks of headache, often accompanied by vertigo and vomiting, neuralgias of the various nerves, facial, dental, supraorbital, occipital, and sciatic, are all of common occurrence; sleeplessness at night and drowsiness in the day-time, great irritability of temper, a sense of general prostration with mental hebetude and attacks of melancholia not less frequently. Many complain of severe aches and pains all over the body, described by some as bone-ache, some of areas of hyperæsthesia, especially over the lumbar region, buttocks, and posterior aspects of the thighs, together with attacks of lumbago and a sense of weight

over the kidneys. The skin suffers in many patients. In some it is only a general roughness and dryness, in others intense itching is added; again we find patches of dry and moist eczema with or without itching, fissures between the toes with intense itching, dry and brittle toe-nails, and a corrugated and striated condition of the finger-nails. Severe attacks of urticariâ, often of a most obstinate character, are not infrequent. The scalp is often dry with a tendency to dandruff and a malnutrition of the hair. The digestive system suffers in the majority of patients; and if we pause here a moment and consider the symptoms in the oral cavity, we will find that here we often get the earliest manifestations. The mucous membranes throughout the body show the earliest evidence of a vitiated blood-current, and that of the mouth is the one where we expect to find the forerunner of many systemic diseases. In the present instance we have an engorgement of the capillaries, especially the veins which give to the gums a bluish tint; where this condition is more marked the gums bleed easily, and if it goes on unchecked a loosening of the gums from the teeth takes place. Pus germs now find their way under these loose gums, and, being nourished by the exuding blood and serum, grow and multiply, and we have the disease pyorrhœa alveolaris. In those patients where the pus germs find no lodgement, atrophy and recession of the gums take place, a condition so frequently seen in persons past middle life, and always due to an improper nutrition. Erosions and decay of the teeth are due to the general malnutrition. How far the saliva and its changed chemical composition influence caries of the teeth the writer is not prepared to state, but he is of the opinion that it must have a decided effect. The actual cause of caries has seemed to him to lie in the saliva, supplemented by a lowered resistance in the teeth to decay, due to their impaired nutrition. The sulphocyanide of potassium in the saliva is a substance which probably varies greatly in amount in different states of health, and is a body, chemically considered, which might easily form corrosive compounds. But little is known thus far about this matter. Neuralgias of the dental nerves and a simple aching of the teeth, pains in the joints of the jaw and the muscles of mastication, fissures in the corners of the mouth, and erosions of lips, gums, and palate may all be caused by the diseases under consideration. Considering further the digestive system, we find in the majority of patients either a constantly coated tongue, or it is

red and glazed; the appetite is often poor and capricious, and in many there is an absolute distaste for food. The stomach digestion is slow, with tendencies to fermentation and acid eructations. The bowels are constipated in most patients. In many there is a decided anæmia, especially in those where these disturbances have existed for a long time, and this anæmia yields but sluggishly to treatment. The complexion is often muddy and of a grayish appearance, with muddy conjunctivæ. The eyes may be the seat of repeated attacks of conjunctivitis, and of iritis. The vision is not infrequently disturbed, as shown by inability to read long by artificial light. The nose and throat show a ready tendency to congestion and inflammation of the mucous membrane,—so-called rheumatic angina is a good illustration.

Patients go on to suffer from many of the above-enumerated symptoms for a long time, being usually better in the summer than in the winter on account of the greater activity of the skin and more rapid elimination, but are rarely ever entirely well. They not infrequently consult a physician for the most prominent symptom, either indigestion, headache, or constipation, and are temporarily relieved. They often consult a specialist for their headaches and neuralgias, or for eczema or inflamed eyes, to be helped for the time being, only to have recurrences after a short time of their old troubles. Some consult us for a pain over the kidneys, and, seeing visions of Bright's with the commonly accepted fatal ending in the near future, have become frightened and seek advice. Upon questioning, they usually unfold a very true picture of a faulty chemistry of long standing. Perhaps the largest number of cases seek advice for persistent dyspepsia and constipation, and are relieved by appropriate treatment promptly enough, but they are not cured, and gradually relapse into their former condition, if the true cause is not recognized and eliminated. As stated above, all the enumerated functional disturbances find their origin in an improper food-supply plus an imperfect oxidation. More fuel is put into the machine than it can burn, and soot and smoke soon clog up the flues. It is both the quality and the quantity of food that does the mischief, and its imperfect oxidation is the result of insufficient exercise in the open air. Now, these two main causes would seem to be easily corrected, for it should not be difficult to prescribe a proper dietary and sufficient exercise, but, as a matter of experience, we find that this is the most difficult part of the

problem, especially if we bear in mind the weakening effects of long heredity on the organs involved, and also heredity as to habits, which is perhaps an even greater enemy. I firmly believe that heredity plays a most important factor in the conditions under consideration, for we often find many of them represented in the different generations of one family. The quality of food should be considered first of all. Looking at the chemistry of the waste product as found in the urine, we find that they all belong to the nitrogenized compounds, and that they are not only the result of tissue waste, but also represent the unassimilated food-supply. The nitrogenized foods are chiefly meats, fats, eggs, and a few vegetables. Chemical analyses of the fæces of persons of widely differing habits and vocations have shown that in all those taking but little exercise from one-fourth to one-half of the food taken passes off in the fæces unassimilated, while in those performing arduous physical labor the fæces consist only of undigestible refuse. We can readily understand, therefore, that over-assimilation must take place from the intestine filled to overflowing with food. All this food assimilated over and above the supply needed by the tissues to compensate their natural waste circulates in the blood-current until excreted by the kidneys. But in order to be capable of transportation by the blood, it must first pass through the chemical laboratory of the body, the liver, and here be changed to compounds which can be excreted. All this work throws an immense burden upon the liver, and we cannot be surprised when it gets tired and lies down occasionally to rest. But when a larger amount of exercise is taken, all the tissues of the body have to supply the energy for this; they then greedily seize upon the food circulating in the blood-current to supply this waste, and thus relieve the liver of all that extra work placed upon it by the reverse conditions.

Theoretically, therefore, the relief for our patients should be brought about by diminishing and regulating the food-supply and increasing the exercise to supply the much-needed oxidation, and this is precisely what practical experience has proved to be the correct treatment. Quite a considerable number of persons seem to be poisoned directly by eating meat rich in blood and the organized nitrogenized compounds, such as creatinin, xanthine, and hypoxanthine; such meats are beef, veal, pork, and mutton, and it is reasonable to suppose that a considerable quantity of their extractives thrown into the blood may act as poisons. Patients thus affected

usually suffer from persistent headache of an intractable character, and not amenable to the usual treatment, but they are promptly and permanently relieved when they abstain entirely from meat. Some of them can return to a moderate use of meat after withholding it for six months or a year, provided, however, they continue to take sufficient exercise. It may be laid down as a good general rule that all patients suffering from the diseases under consideration should eat little or no meat. They should eat largely of fruits and vegetables, and should endeavor to get as mixed a diet as is possible into each meal. They should also abstain entirely from wines and malt liquors; a little whiskey and water *with* the meal may be allowed. The wine-acids are especially objectionable, as they seem to interfere with prompt elimination, presumably because they abstract a considerable quantity of the alkalies of the fluids, so much needed in the transformation of the poisonous compounds into non-poisonous. The majority of these patients do not drink a sufficient quantity of water, and this habit should be inquired into and corrected. The habits of exercise should be carefully ascertained. It will be found that most all of these patients take little or none, and they must be made to take plenty of vigorous out-of-door exercise; bedroom gymnastics with dumb-bells and apparatus are not sufficient. Another great aid is found in maintaining the skin of the body in the greatest state of activity. No doubt the best method for this is cold bathing and brisk rubbing with coarse towels; this increases the circulation, removes the dead epidermis and stimulates the glands to greatest activity. In those who cannot endure the shock of cold water, a warm bath followed by a cooling douche, or Turkish and Russian baths, may be substituted. The object is to get the skin to do its utmost in aiding elimination, so as to relieve the kidneys of much of their work.

If these suggestions for the dietetic and hygienic management of the cases are faithfully followed and maintained, a cure will sooner or later be effected. But many patients claim that they have not the time to attend to all the necessary details, and want medicines for the relief of symptoms. Indeed, in almost all cases we have to give drugs for the relief of the most distressing symptoms, for a time at least, until the dietetic and hygienic changes have had a chance to alter the faulty chemistry. The object is to relieve the many distressing symptoms, which is best obtained by those drugs which will act as solvents and eliminants of the retained waste

products. If we recall the chemistry as outlined at the beginning of this paper, we note that the acid urates chiefly, and to a lesser degree probably also creatin, xanthine, and hypoxanthine, together with some percentage of oxalic acid and its compounds, are the substances which we wish to get rid of. We also note that the compounds of the lighter metals, lithium, sodium, potassium, and ammonium, act as solvents of the uric acid series, and that hydrochloric and nitric acids act as solvents of the oxalic compounds. These facts established in the laboratory are proved to be correct when applied to the treatment of the cases under consideration. The writer has found from a considerable experience that *salicylate of lithium* is the most valuable drug at our command, and employs it usually in from ten- to thirty-grain doses given directly after meals. This drug differs from most of the other salts of salicylic acid in that it is well borne by most stomachs for a long time. Its good effects are very prompt, often relieving a severe headache and aches and pains in different parts of the body in a few hours, and after its use for a few days a general feeling of lightness and well-being is experienced. When the mineral acids are indicated I use a mixture of the strong nitromuriatic acid in glycerin and water, giving from three to five minims immediately before or after meals, preferably before meals. The relief experienced in many cases is often very prompt, and makes a deep impression on the patients. The *salicylate of soda* is not as good a drug as the salicylate of lithium in these cases, does not produce results as promptly, and is not well borne by most patients. The best mode of treatment is to give first a dose of calomel, preferably in divided small doses throughout the day, which is repeated once or twice a week according to the severity of the case. Another drug of great value is *salophen*, one of the coal-tar derivatives of more recent discovery. It has given instant relief in several cases of muscular rheumatism, rheumatic angina, and in some cases of severe urticaria. It is given in fifteen- to twenty-grain doses three or four times daily, is not disagreeable to the taste, and does not upset the stomach.

These comprise in a general way the drugs which the writer employs for these cases. The various local manifestations will of course often require special medications for the relief of more urgent symptoms, but, as a rule, if the above management is followed, most of the cases do well. Of course cases are met with

which do not yield readily,—in fact, are very obstinate. In these I think that the conditions have lasted so long that organic changes have taken place and the normal functions of many organs are impaired, or they do not follow out faithfully the indicated treatment.

From the foregoing it is evident that the treatment of the diseases of the oral cavity, caused by the faulty elimination of tissue waste, must be constitutional and not local. *Pyorrhœa alveolaris* must of course be treated locally, but this can be only palliative, because we cannot reach the deep-seated pockets of suppuration under the gums. When the suppurative process has become well established, we can only give relief by syringing with peroxide of hydrogen and other antiseptics, but before the pus germs find a lodgement, and when we only have the spongy, bleeding gums, the condition should be curable by vigorous systemic treatment and strict attention to diet and hygiene. Even when a slight suppuration does exist, much can be done by combining the local treatment with the systemic, with a fair prospect for a cure in many cases.

If this faulty elimination goes on unchecked for many years, organic changes must be the inevitable result. The arterial system seems to be first affected. The fibrous tissue of the arteries is increased, phosphatic deposits take place, and a lessened elasticity of the vessels is the result. This in turn produces an obstructed circulation and consequent impaired nutrition of the various organs. From this parenchymatous changes occur, the parenchyma being replaced by fibrous tissue, and organic disease becomes established.

SYMPOSIUM ON DEGENERACY OF THE PULP.— PRELIMINARY WORK.¹

BY EUGENE S. TALBOT, M.D., D.D.S., CHICAGO.

MANY years ago it occurred to me that physicians could follow generally with advantage, both in pathology and physiology, the example of neurology and study of the human body from the stand-point both of its embryonic and post-uterine evolution and

¹ Abstract of a paper read before the Section on Stomatology, at St. Paul, Minn., June, 1901.

from the stand-point of its degeneracy as well. It was long recognized that health simply constituted a balance, and that disease meant the destruction of this balance, with resulting undue predominance of some healthy functions and the undue depression of others. Practically the same rule is followed by the chemist who controls his analytic experiments by his synthetic, and *vice versa*. Physicians and dentists generally, in studying man as an entity, view the differences between the normal and the abnormal as of kind and not of degree. To avoid this error I have studied the degenerate phases of man from the stand-point of etiology, physiology, and, lastly and most important, from the stand-point of embryology and post-uterine development periods. The result of these studies has been the general discussion of degeneracy as a phase of evolution, in "Degeneracy: Its Causes, Signs, and Results," published in London in 1898. The local degeneracies, either as an expression of general advance or its reverse, have been outlined in my works upon "The Etiology of Osseous Deformities of the Head, Face, Jaws, and Teeth," "Irregularities of the Teeth and Interstitial Gingivitis, or So-called Pyorrhœa Alveolaris," and "Degeneracy of the Alveolar Process." It is now my intention to discuss one of the most important of local degeneracies so far as dentistry is concerned,—degeneracy of the pulp. Last winter I arranged with Chicago dental surgeons that extracted teeth should be saved for me. My assistant collected from their offices every afternoon at four P.M. The teeth were then cracked open at my office, the pulps removed and placed in Müller's Fluid and one per cent. formalin before six P.M. From nineteen hundred and fifty-eight teeth obtained, one thousand and seventeen pulps were removed. Macroscopically the pulps were thus divisible: Normal; exposed, inflamed and suppurating, mummified, calcified and calculous; fungoid with exostosed roots; loose teeth abrasion; pulps destroyed with arsenic and deciduous teeth-pulps. Sound erupting third molars and bicuspidis extracted in regulation had been placed in Müller's fluid ere they came under my observation.

In every case the root had to be crushed before the pulp could be detached. Pieces of the cementum almost invariably adhered to the pulp, which it required considerable force to detach. The slight adherence of pulps to the chamber was due to anatomic construction. This peculiar relation of the pulp to the walls of the canal becomes obvious when attempts are made to remove it in

single-rooted teeth, after application of arsenic. The nerve-broach not infrequently carries the pulp with it in passage towards the apex. The pulp often comes out in a doubled-up contracted mass. Sometimes it comes away in pieces, and sometimes the pulp is not entirely detachable from the end of the root. The claim that pulps immediately removed from the teeth after extraction adhere to the wall of the canal is not borne out by experience. If nerve-fibres radiated from the pulp and extended from the dentine, it would be impossible to remove the pulp from its chamber. The pulp, however, cannot be removed from the end of the root without breaking; it therefore seems evident, from a macroscopic stand-point, that nerve-fibres as such do not enter the dentine. In removing the pulp it always remained *in toto* on account of the strong connective tissue.

A point of great interest in connection with pulp adhesion to the root is not only the degeneracy of the pulp, but also of the tooth. In development of the tooth, calcification begins at the crown and extends towards the apex. Calcification takes place at the periphery of the root and extends towards the centre. A marked opening results with a large primitive organ (the pulp) until the apex is reached, when it closes. This closing often continues long after the crown has erupted. The foramen is almost completely closed. What was once a large pulp containing nerves and blood-vessels tapers down to the minutest size with but only one or two blood-vessels and nerves remaining. In the lower mammals, teeth have open ends with large pulps. These furnish sufficient nourishment to the teeth and resistance to decay. Of the one thousand and seventeen pulps collected, one hundred and thirty-one, or 11.9 per cent., were more or less mummified. While no special attempt was made to determine the extent of mummification, seventy-five per cent. of the one hundred and thirty-one seemed mummified. The remainder had varying degrees of mummification, beginning at the apical end. The extent of bloodletting at the time of extraction governed the degree of mummification. The question further arises, What amount of blood did the pulp contain at the time of extraction? Did the closure of the apical end of the root cut off the blood-supply? It is certain that teeth with mummified pulps were hard, dense, and comparatively difficult to crack. In pulps partially mummified there was a demarcation between the part filled with blood and the dried end. In the dried end mummi-

fication was complete. The dried specimen was removed from the end of the root with as much difficulty as the normal pulp, while the main part could be readily lifted out of the chamber, as there was no adhesion. The pulp can become completely mummified in from six to twelve hours. All the teeth from the same mouth were sometimes mummified. The pulps in abraded teeth had receded and been almost obliterated. Recession is sometimes followed by obliteration of the pulp-chamber. In most cases, the filling of the pulp-chamber does not follow. Blood-supply is almost if not quite exhausted. In cases where the roots were exostosed the pulps were often almost obliterated with corresponding filling in of the pulp-chamber. In other cases, mummification of the pulp occurred. There were seventeen (1.5 per cent.) calcified and calculous pulps. In some the tooth had to be completely crushed to remove the calcified mass which had adapted itself to the walls of the cavity. In others the pulp could be removed in its entirety, so complete was the calcification inside the pulp itself. There were four fungoid pulps of the one thousand and seventeen. In all four pulp-stones could be felt. The percentage of minute pulp-stones can be determined by the microscope alone.

In interstitial gingivitis, where the alveolar process has receded and the roots of the teeth have been exposed for some time, the pulp recedes and the canals become filled with dentine. Although the pulps are alive, the substance in the tubuli decomposes and the odor is more penetrating than that from dead pulps. The dentine becomes dark, and twice as much force is required to break open the tooth than in the normal variety. These teeth are brittle and fly to pieces, while the normal tooth splits lengthwise.

The pulp is a temporary organ, having attained its normal size and hence been at its best when it commences to form the dentine. The apical foramen is largest in the lower vertebrates. Pulp-stones or secondary dentine are the commencement of degeneracy. No lymphatics (Sudduth) exist in the pulp, since it is a formative as well as a degenerative organ. One hundred and thirteen, or 11.1 per cent., of the pulps examined were exposed, infected with pus, and sloughing. The inflammation sometimes extends throughout the entire pulp. Sometimes one part or side only is affected. In the case of a molar, inflammation often extends upon the side of the pulp and into one root. The other side of the pulp root or roots remains normal or is but slightly affected.

Reports of Society Meetings.

AMERICAN MEDICAL ASSOCIATION, SECTION ON STOMATOLOGY.

DISCUSSION ON SYMPOSIUM ON STATE BOARDS OF DENTAL EXAMINERS IN THEIR RELATION TO THE PROFESSION AND THE COLONIES.

Dr. Eugene S. Talbot, Chicago.—One important part of dental education consists in the appointment of State boards, as well as the quality of men upon these boards. A great responsibility not only rests upon them, but also great power. These men should be selected from the State dental societies. Twice the number of men required should be selected and appointed (at least the number required by law) by the governor of the State. Good men are thus secured, their appointment is legal, and it places the responsibility. The proper men can wield a great power, and they do as it is, but if they were qualified men, of high ideals, of education, the specialty would be placed where it belongs. I believe these men can control the colleges and place the entrance and final examinations exactly where they should be. That the graduates are not up to the standard has already been shown in the examinations made in the army through the National Examining Board for the army and navy. I have received a letter from Dr. Marshall in which he says forty-two graduates have been examined, and only eleven had passed. This shows that the graduates of our dental schools are certainly lacking in some particulars. This has already been noted in an editorial in one of the journals, showing great interest in the symposium of last year. Dr. Marshall's report shows that something more is lacking, and no doubt the agitation of these subjects will be productive of much good at the next meeting of the National Association in Milwaukee. This editorial hoped the men would not return to their homes without advocating the introduction of a four years' course in every dental college, and I believe the time is coming when a four years' course will be demanded, thus giving the student a firm foundation for his life career.

A four years' course will necessitate a better understanding of the subjects the teacher has under discussion. Pathology, of

which the student and the profession alike know very little, will and should become one of the principal branches. The bacteriology of the mouth, a great factor in diagnosis, is really a department of dentistry, and yet the first principles are scarcely taught or understood. The etiology of diseases of the mouth is yet in its infancy, and the coming dentist must not only be a "plugger of teeth," but an all-round pathologist.

Dr. Vida A. Latham, Rogers Park, Ill.—I think the solving of the whole question comes with the preliminary education. Supposing the candidate enters Northwestern University, the Chicago Dental School, or any other dental college. The candidate comes in just the same as Dr. Chittenden here would come in, and is permitted to register. A man or woman comes in with a diploma from the high school in the city of A. That is a high degree for the time being; she has a good education. Another comes in from the high school in the town of C who can hardly write her own name. That has been proved over and over again. There are all kinds of high schools. You take a high school in Duluth and compare it with a high school in Chicago, or take a high school in New York and compare it with one in Holyoke,—all come in under a high school diploma; how can you make them equal or expect them to be equal? I myself had to reject candidates with a high school education. If the student does not know these common branches he cannot compete in those classes. They go before the dean and are advanced or put back, therefore they cannot do the work unless they have a good education first. That is the trouble in standardizing the elementary requirements in every case.

There is another thing to be brought out in this connection. Supposing I advertise, or that I am a quack,—I have a perfect right to be so. The State board does not take my diploma away. I can move into another State and can practise again. These are the things that should not be tolerated in this country.

Dr. R. R. Andrews, Cambridge, Mass.—I want to say a word in regard to raising the standard among examiners of the different States. In New England they are trying to raise the standard high enough in each State so that a student may take the examination in any State and practise without taking a further examination in any of the New England States, and that is what the profession at large is demanding. Public opinion is getting very strongly in favor of such a movement, and if the national body can adopt

such a standard and live up to it, and once passing a man and passing him well and giving him the privilege of practising in any State without further examination, it will be a very desirable thing. From the fact that a man may pass a very creditable examination in all points, in bacteriology, chemistry, etc., at the time of graduating, and in five years, on account of sickness or something else, he is obliged to go to another State, he is not in condition to pass that same examination, yet he has passed five or ten years in honorable practice, and it seems to me he should be exempted and allowed to practise with that record behind him. It is to be hoped that some sort of an arrangement will be brought about sooner or later so that a man having once passed a creditable examination in any State shall be allowed to practise in any State.

There is another matter that I think will be considered in time, and that is the giving of State boards certain rights to consider cases where a man has been engaged in honorable practice for twenty or thirty years, and perhaps his wife's health or his own compels him to go West. I have in mind the case of a man who was one of the founders of the Harvard Dental School, a man who had had thirty years' active practice, and who was one of the best practitioners in Boston, who went to California. He was a man perhaps fifty-five or sixty years of age. At that time the State board had been in existence only a little while. He was called before the board and he confessed that he could not pass the examination in chemistry and bacteriology at that time, but said he could have done it when he graduated. He took the examination, however, and failed, and afterwards, in the course of two or three years, he took it again and received his license. It is hard on an old man. He is not in the condition of one who is learning and who can learn more readily, and it seems to me these cases should be considered. I have in mind a man who graduated from one of the schools in Boston. I think he failed after the three years' course and took two more years to get his degree. He is a man easily rattled by an examination, but he finally got his degree and went to Germany and practised there a number of years—I think eight or ten—with his brother. He is a fine operator. He is so fine a mechanical operator that he is to-day employed as one of the demonstrators in the schools of Boston. There is no question but that the public would be well treated if he had been given his registration. The object of regis-

tration is to protect the people from quacks. I myself am a stickler for a good, solid examination, but the examinations given by some boards, especially new men that have just come in, in some cases are pretty severe, and it has been acknowledged by some members of the board in Massachusetts that it would be very difficult for them to pass their own examinations. In fact, a member of the board of Connecticut moved to Massachusetts and tried to pass, but was turned down. I think he is studying now to pass the board, but if he does pass he will perhaps be a no better man. It seems to me, if the standard can be so raised and equalized in all the States, there will be no need to pass the examination when a man moves into another State.

Dr. Charles Chittenden, Madison, Wis.—I think there is scarcely a board in existence that does not consider the number of years a man has had in practice. In Wisconsin our board has in its code of rules something like this: "Candidates having had ten years or upward of practice immediately before applying for this examination shall be required to pass only a fifty per cent. examination." I think that rule applies in a majority of States.

Dr. F. S. Dennis, New York City.—I am not actively engaged in the work of dentistry at the present time, but the raising of the standard of dentistry is something that always appeals to me. The question came to my mind as I listened to a paper that was recently read, as to what would be the remedies for raising the standard of dental education. We have talked about dental education for years, and I believe the subject has been brought up repeatedly in this section of the American Medical Association. Is it to be remedied by law or simply by the good intent of the majority of those who have this matter in charge? By that I mean the faculties of the different schools or the members of the State examining boards.

The matter of requiring a dentist going from one State to another to pass the examination of the board of that State it seems to me is entirely wrong on the part of our examining boards. They seem to fail to recognize that years of labor and years of reputable standing in a community count for very little compared with the examination. Examinations of a dentist's ability, as a rule, do not amount to much. I think that is recognized by medical men generally. Oftentimes an examination shows but very little of what a man is capable. This is recognized by examining boards

in hospitals. Often in connection with the examination they will take into consideration not merely the quality of the paper that is presented, but the quality of the man, his moral standing, his standing in the community, and his ability in lines outside of mere memory, by presenting cases to test his ability. It seems to me that a dentist who has worked for years in one State ought to be valued for his manipulative ability very much more than to have his standing judged entirely by a written paper.

In regard to the matter, advocated in one of the papers, of paying for the work of the examining board by fees from the candidates for examination, I think that method has been so thoroughly tested and proved a failure that it seems to me entirely out of the question to consider it here. The people are the ones who should bear the burden of expense. They are the ones who are being protected by the examining board, and they should bear the cost of the examination.

Dr. J. R. Currens, Two Rivers, Wis.—I am not a dentist, but I am a member of the examining board of Wisconsin. We had a meeting of the representatives of the examining boards of the United States yesterday in which these matters came up, and one subject impressed me here to-day, and that is in regard to reciprocity between the different boards. I think if something can be arrived at, and if our laws can be so framed that it gives boards the power to recognize licenses from other States, I cannot see but what it is the right thing to do. In the medical profession we have a little more difficulty than you dentists have. We have three or four schools to contend with, and the situation is a great deal more mixed. We have on our board two regulars, two homœopaths, and two eclectics. After the 1st of July we will have to take on one of our manipulative friends. In regard to this reciprocity business, there are many men who have grown old in the profession, whose family surroundings are such, the condition of their health is such, that they are forced to seek a climatic change, and it is a great hardship to those men to put them through an examination. The matter of diplomas and examinations came up here this afternoon. It is very hard for the State board of Wisconsin to tell about the standing of a medical college in Alabama or Tennessee. For example, these schools will publish a curriculum that will arouse admiration, but they will graduate students in four months and take almost anything in the way of entrance re-

quirements. Under our law we can require both a diploma and examination, and we will have such under direct control. It is all right to use a diploma if it is known to be from a reputable school, but you cannot have class legislation, and there are very few boards that are allowed to use their discretion unless they have an investigation, which is a rather doubtful piece of business. Most boards have to be self-sustaining, and it would be an admirable thing if they could prevail upon the legislators to make the concession, but it is difficult to make these believe that it would be for the benefit of the people instead of the medical men and the dentists. They want us to be self-sustaining, and it places us at times in a rather bad position. There was a flaw in our law in the revision of the statutes so that we could not even send a man out to investigate a case without calling the whole board together. We had a reserve fund of twelve hundred dollars, and the result was that we had to turn it into the treasury. We tried to get it back, but could not do it. We had no money to investigate anything; the State has the money and it will stay there.

To my mind the solution of the whole matter would be this: In the first place, raise the standard high. See that the primary education is brought up to a high standard. In regard to the high school standard which has been referred to, we have a clause in our medical law which provides that the high school standard must be up to the high school standard of our State. In that way any difficulty can very easily be obviated. One medical college fought very hard against the high school standard, and we had to cut it down to the junior year, but we expect to raise it two years from now. We cannot move rapidly in these things, and in this reciprocity business we must try to get the State laws on the same plane, and if we all join hands the matter can be accomplished. The laws are queer things to handle. There is that word "reputable" that was in the law. If a man is from a reputable college the board has some discretionary powers, but if you get too particular about it the board may decide you are a little too strict. It is a hard thing to learn the ways of the law. We had a case before our board. Our law of 1897 was a very fair law. A disreputable individual took several courses in some Omaha medical college, and they refused him graduation. They pretended he did not come up to the standard. The fact was he passed a good examination, but he was refused his diploma on account of his

moral character. The result was he went to St. Louis and graduated from the Barnes Medical College. He then went to North Dakota, and the secretary of the State board of North Dakota wrote to our secretary that the man was disreputable and doing all kinds of dishonorable things. He ran a lightning-rod business. He would go to a farmer with twelve children and tell him if he would give him a note for one hundred dollars he would take care of his children for twelve years. He took notes and sold them to some banks. He did the same thing in Iowa and Nebraska. Then he came to our State and wanted a license, and we refused him. We supposed our law was all right, but there was a revision of the laws in 1898. Our board feared the session laws of 1898, but supposed they were all right, but they changed the wording somewhat and the punctuation. The case came before a jury, and the fact of the matter was he beat us and we were obliged to license him. Now he threatens us with personal damage suits.

Dr. R. H. Nones, Philadelphia.—I am interested in the symposium and talks I have heard. There are some apparent remedies, but to select one that would answer every case is a difficult thing to do. If we do seemingly find one, it is succeeded by another problem, until we find it is impracticable. The question of how you would take care of the older practitioner if he wanted to move from one State to another, is one of the problems to be met. It would be opposed in some States that did not want a man to come over from another State, and that brings up the question of the survival of the fittest. It is a very well-known fact, yet a very sad one, that if a man has been in practice for some years he neglects many of the theoretical branches which the examining board requires him to take. Now, if that man has not taken such an examination that is demanded of the younger men, I do not see how you could get a State board to pass him. Many a young man, as has been suggested, might make a very competent dentist if he had those qualifications in later years. Why should not that young man have this same privilege to enter and bring up the necessary qualification as the older man has where you give him credit for forgetting his earlier qualifications? I say this problem and many similar problems have come to me. We have tried to get too many things instead of getting one good thing at a time. I believe, had the Association of Dental Faculties incorporated into their law a curriculum that should have been

passed by the student, his preliminary education would have been much better than by grading the standard to one, two, or three years, whatever it may be, of high school. With all the careful consideration given by these gentlemen, they little thought that immediately it was entered upon the question would come up, What is one year of the high school in one State or another? Immediately that trouble arose, and it has been one of the very hardest things to contend with in colleges. I can verify Dr. Chittenden's remarks in regard to qualifications; I have seen them in all forms. When credentials have been presented to me I have invariably taken these from the students and told them I would send them to the superintendent of public instruction to have them passed upon. If a credential comes back I can follow the student, should he go to any other school, and object to his entrance upon it. The other gentleman who spoke made the point of a faculty being liable to be mandamusd. That is a very strong point, indeed. You think you are treading on safe ground when your State board says to a graduate that he is not a graduate from a reputable institution. The question comes up, What is a reputable institution? In order to emphasize that point I will cite the case of the school I am connected with, the Department of Dentistry of the Medico-Chirurgical College of Philadelphia. We had some difficulty to get our dental college into the faculty. They refused us admission, and we went to teaching dentistry under the charter of the medical college. We sent our students before the State board, and they refused to examine them. We threatened them with mandamus proceedings, and after consultation with the Attorney-General they were compelled to examine our students. They passed the board, and shortly after that we were admitted to the Association of Faculties. Other States refused to do the same thing, but they soon fell into line. The men on State boards, as a rule, are very busy men, men who cannot afford to give their time to such work as this. I have seen a great deal of it. I am acquainted with the members of the State board of Pennsylvania, and I know the amount of work they have to do. I say there is absolutely no pleasure attached to it.

It is a difficult problem when the compensation of the men on the State board is to be considered. The class of men that should be on the board are difficult to obtain, because their time is of a great deal more value to themselves than the recompense they get

from the State. I see no other plan except that of the fee being paid by the applicant. It is a matter of the utmost folly to ask the public to pay for such services by taxation. The general public does not desire protection. I went through one of the large department stores in Chicago, and it was a matter of surprise to me that here was being performed work in dentistry at "fair" prices. They claim to do crown- and bridge-work. If the public does not want protection in the large cities, what could you expect in the smaller towns where the people would be taxed for this protection? Would they want it? I say, most assuredly not.

There is another point that struck me while listening to these papers, and that is in regard to the matter of Dr. Marshall passing only eleven out of forty-two. That, at first thought, casts somewhat of a reflection on the various schools throughout the United States. To my mind, this would be an incorrect conclusion, for the large majority of those coming before the examining board have been several years in practice, and you can see at once that it makes it difficult for these men to pass.

I say, without hesitation, I believe the majority of the State boards of the United States could not pass their own examination. I do not think these gentlemen could have possibly kept up with the various theoretical subjects. I think it would be a point of much interest had Dr. Marshall informed us whether the failures before the army board were in the theoretical or the practical branches. I have always tried to find out the weak points of my students when they appeared before the State board, and tried to strengthen them on those points in college.

Dr. A. H. Peck, Chicago.—I shall not attempt to enter into a detailed discussion of the different phases of the various subjects that have been presented for our consideration this afternoon, but I do want to say that I have listened with a great deal of interest to the subject-matter presented in this symposium. Every phase is of vital importance to us, not only in dental practice, but as doctors in the dental profession, and I want to say, before proceeding further, that the work presented in the symposium last year on dental education I know has resulted in a great deal of good in dental educational circles. So I predict that the matter presented in this symposium this afternoon will in the future wield its influence for good. Personally, while I know that the officers of this section, who are especially

interested in this work, are not here for the purpose of soliciting praise, yet I do feel that I want to thank them for taking up this subject and bringing it out in such a splendid manner. We must give these matters our careful personal thought and attention, we must continue to agitate them, and we must never let an opportunity pass where we can say or do anything to further the interests of higher dental education. I have always used my influence in the way of advancement of the cause of dental education in all its phases. A great deal has been presented this afternoon for our consideration, and unless an individual has given the subject a great deal of attention and thought before coming to this meeting, it is apparent that he comes here rather unprepared to discuss the subject in the most intelligent manner. I am sorry I did not have the substance of these papers to look over previously. I would have enjoyed studying them so that I might speak more to the point and possibly advance some more plausible theories or ways by which the suggestions outlined therein might be carried out. Just what is the best method of accomplishing all these desired results is quite a problem. Dr. Talbot has stated that State examining boards have power to regulate some phases of the individual college work, such as the entrance of students, preliminary requirements, etc. If Dr. Talbot's judgment is correct, and in a measure it is, I do hope the day is not far distant when the State dental examining boards may be placed in position where, by special legislation or advancement of public sentiment, they may be able to successfully use the power that is placed in their hands that the entrance of students in our various colleges may be regulated and placed in the proper condition, because we all know that the entrance of students has not been what it should be. They pay very little attention, as a rule, to credentials presented by students. Many of them are private institutions, and are in the field for private gain. This is a demoralizing condition of things, and may the day be hastened when this condition may be eliminated and our institutions placed on their proper plane.

*Dr. Charles Chittenden, Madison, Wis. (closing discussion).—*This is a subject so interesting to me that I never know where to begin nor where to stop. There is no question about the power of examining boards, provided they have the dental colleges and the dental profession at their backs. Examining boards can do anything that they desire should be done for the dental profession

in the matter of standards. As I tried to exemplify in my written paper, there is no question but that the boards and the colleges together can do all there is to be done in this matter. The difficulty has been in the past with the colleges and the Association of Faculties. If the members of that Association were asked, they would admit that they have in the Association many schools that ought not to be recognized. I believe last year there was a school examined by a special committee of the Association of Faculties, and a report brought in, which I had the honor of being permitted to see, prepared to be presented to the Association, but it was so seathing in many of its criticisms that the report was withheld. I hope to see that report brought forward some day and the school properly dealt with. This Association feels that it has a lot of weak schools represented, but the disturbance of the Association is not desired. They do not seem to remember that they should come to the examiners and join hands and settle upon a standard.

The gentleman said he would like to know in what branches the students were most likely to fall down. Our experience has been that students fall down first in simple anatomy. They will fail on a dozen questions that almost any child in a common ward school could answer. That has been our general experience.

I desire to append the following letters, which speak for themselves:

"SCHOOL OF DENTAL SURGERY, WISCONSIN, July 29, 1899.

"GENTLEMEN,—Bearer, _____, of this city, is a young man of good moral character and a very good student. In the year 1896 he was qualified to hold a second grade certificate to teach school in _____, which was equivalent to a three-year course in the high school of this city.

"Yours truly,

"_____,"

"*Superintendent of _____ School from 1894-1896.*"

"STATE OF _____, DEPARTMENT OF PUBLIC INSTRUCTION,

"September 24, 1900.

"DR _____, Chicago, Ill.:

"DEAR SIR,—Mr. _____, the bearer, impresses me as a young man in every sense qualified to take a dental course.

"He states that he completed the graded school course and a portion of the first year of the high school course in the city of _____. Since then he has had several years of practical experience in a telegraph office in this city.

"Respectfully,

"_____,"

"*Assistant State Superintendent.*"

RESOLUTIONS.

WHEREAS, Dr. John S. Marshall of Chicago, one of the most steadfast believers in the principles which this the Section on Stomatology of the American Medical Association represents, for many years past an earnest co-worker with its members in all efforts to establish the science of oral treatment upon the high plane necessary to perfect affiliation with other branches of medical science, having given evidence in the essay before us for consideration that he is carrying forward this work in practical and beneficial manner in an entirely new field; therefore be it

Resolved, That the secretary of this the Stomatologic Section be, and hereby is, instructed to forward to Dr. Marshall congratulations upon his appointment as Chairman of the Board of Examiners of Dentists for the Army and Navy, and also in consideration of the high standard of excellence required of applicants for examination to the end that the dental profession may be honorably and creditably represented in this branch of the service; and be it further

Resolved, That the members of this Section tender to Dr. Marshall at this time an assurance of their most earnest support and willingness to assist or encourage in any manner possible the furtherance of the good work he has so ably begun, the details of which have been clearly set forth in his valuable contribution to the programme of this meeting.

EUGENE S. TALBOT,
Secretary.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A MEETING of the Institute was held at the office of Dr. Horace J. Parker, No. 27 West Thirty-eighth Street, New York, on Tuesday evening, April 2, 1901.

The minutes of the last meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Dr. F. Milton Smith.—I have one or two practical little things which I use every day in my office, and it has occurred to me that they may be of interest.

First, a glass cube which Dr. H. G. Marshall gave me about ten years ago, which I use to mix cement fillings upon. I find it very convenient because it is frequently necessary to make two mixings of cement without cleaning the slab. This can be done with this cube by simply turning it over. One side has two little places ground out with a carborundum wheel. These are useful in placing a drop of medicament for a treatment.

I should like also to call attention to a set of tools which every laboratory worker will recognize as scrapers. They are of a very small size, indeed much smaller than I had formerly supposed could be obtained. I find them to be of great practical value in plastic filling work, especially in cutting down fillings after they have become hard. I have four of the smallest sizes, and use the back or convex side for packing and burnishing.

Dr. E. H. Raymond.—Mr. President and gentlemen, in presenting these casts I do so because they have been so exceedingly interesting to me. They are casts of the teeth of little twin girls ten years of age. They present the most perfect cases of parallel development which I have ever seen under a similar environment. I will call attention to a few of the points. In the upper jaw the canines on the right side are almost fully developed (about two years “ahead of time”) and exactly alike. On the left side the points of the canines are visible. The bicuspid are all developed except the left superior second in each case.

The rugæ also are almost identical in number and shape. In the lower jaw there is a perfect development of all except the right twelfth-year molar, and of course the wisdom-teeth. The carious points which have manifested themselves are also alike in each case. The mother tells me that in disposition and temperament they are alike; the color of hair and eyes and the shape of the features are as one. From a dental stand-point I think you will be interested in the two casts.

The President.—This is what we would expect to find in the case of twins, yet I have twin patients, young girls, who are exactly the opposite. They are totally unlike in their disposition, their physical make-up, and their teeth. The teeth of one are so frail that they constantly need attention. The teeth of the other are so perfect in structure that they need scarcely any attention whatever.

Dr. C. O. Kimball.—I have twin daughters, twenty-one years of age, and seeing these models of Dr. Raymond's calls to my mind the models of their mouths. The history which Dr. Raymond has been giving sounds strangely familiar to me, for the development of my own girls has been almost identical. The minute changes in the mouth, such as the position of decay, have been as he has described, except that they have extended over a longer period of years, so that I have been able to watch the development for a

longer time. It is a typical case of twin development, and those who know them know that their faces and figures are almost exactly the same.

Dr. E. A. Bogue.—At Dr. Delavan's lecture last Thursday before the dental societies he was asked whether any improvement had been made in the treatment of syphilis in recent years. He replied that there had been no improvement that he knew of in the last fifty years. A few moments later, after a number of gentlemen had left the room, he asked me to repeat what I had just told him, in regard to recent discoveries on this point made at the Pasteur Institute in Paris by Dr. Lisle, an American physician working there. I shall be glad if the President will allow me to state a little more fully here what I tried in a few words to say there.

About two years ago Dr. Lisle thought he had isolated and discovered the microbe of syphilis. I saw his specimens last September, and take pleasure in exhibiting a photomicrograph of them which I have recently received from Paris. Dr. Lisle was to deposit the results of his investigations at the Academy of Medicine in Paris on March 5 last, in order to establish the priority of his discovery, and from this time on Professor Metchnikoff takes personal supervision of the further work of investigations and proving the results of this discovery, all of which goes to show that the matter is seriously considered at the Pasteur Institute. Should the expected results arising from this discovery be attained, the treatment of the disease will undergo a very radical change; and it will be treated by means of antitoxins, much after the fashion that diphtheria, the bubonic plague, and rabies are now treated. In that case hopes may be entertained of a radical cure for the disease, something which no one as yet has dared to predict.

The President.—We are to have the pleasure of listening to a paper by Dr. J. C. Bierwirth, of Brooklyn, entitled "Uric Acid in its Relation to Disease, with Special Reference to the Diseases of the Oral Cavity."

Dr. J. C. Bierwirth.—When my friend Dr. Parker requested me to read a paper on the subject which I have selected I expressed my doubts as to whether one so purely medical, as this kind must be, would be of interest to your society. However, he was kind enough to tell me to prepare my paper as I saw fit, which I have done. If I am a little deep in chemistry I ask you to pardon me, and I

will simply say that it is necessary for a better understanding of the subject. Dr. Kimball very kindly sent me a list of questions, in reply to a request for some suggestions to guide me in the preparation of my paper. I find out, however, that it will be better to answer these questions in the discussion rather than embody them in the paper.

(For Dr. Bierwirth's paper, see page 534.)

The President.—Gentlemen, this splendid paper of Dr. Bierwirth is before you for discussion. We will be very glad to hear from any present who will participate in its discussion.

DISCUSSION.

Dr. C. B. Parker.—I first want to thank Dr. Bierwirth for his entertaining and instructive paper, which to me has been very interesting indeed. As to the discussion, I shall be obliged to agree with him so far as I understand the subject. I have never performed any scientific work in this line, but quite a little of what I shall call practical observation. I have been specially interested in a line of work that in a great degree, I firmly believe, has been the result of stasis caused by uric acid. I refer to pyorrhœa alveolaris, caries, and necrosis of the jaw, and where the maxillary sinuses are involved. I believe that if we will try and cover a larger field in our knowledge than the tooth and its immediate vicinity, our patients will soon reap the benefit, and we will be well awarded in spirit.

The small part I shall take in this meeting is to read a few of many cases of record, simply to show where I stand and what I think we are coming to in the treatment of the majority of cases of pyorrhœa. Not to treat them by pushing an instrument clear to the end of the root and sending the patient home sick for the rest of the day, but to use palliative in connection with the important systemic treatment. In that way one will be able to control these cases, even if they cannot be cured promptly. The average treatment that has been given them in the past I know is not necessary, for I have secured far better results with the palliative treatment in conjunction with the uric acid systemic treatment. Now, if what little I have said or in the cases I shall read will but provoke some discussion, I shall be satisfied, for in that we are sure to gain some knowledge.

CASE I.—A young lady, Miss A., seventeen years of age, com-

plained of the right superior central feeling sore. I treated with aconite and iodine, and she returned in a few days with several others in the same condition; the festoons between the teeth were beginning to loosen and smell. They were treated as before. Three days later she returned with a slight improvement; the same treatment was repeated. In three days she returned; condition about the same, with the exception of the incisor spoken of, which was beginning to loosen and elongate. A very careful examination was again made, and nothing found around the necks of the teeth. The palliative was continued a week or ten days with no decided improvement. I then advised her to see her physician at once for a physical examination, which was done. A day or two later he telephoned me that he was afraid she was in for a fit of sickness. In a very short time she went through a severe rheumatic fever; all the teeth became so loose and elongated, especially the central, that saving them was despaired of. The uric acid treatment she received cured all trouble in the mouth. Twice in the past eighteen months she has started in with what appeared to be the same condition as the first time, so far as the appearance of the teeth and mucous membrane were concerned. I recommended the systemic treatment in conjunction with the palliative for the teeth and gums, with satisfactory results at once.

CASE II.—A physician complained that several of his teeth seemed lame and sore. Every day or two he called for treatment. At first it looked as though we were gaining some headway; then the gums began to swell all along one side of the jaw, two of the teeth becoming quite loose; then a little exudation of serum and pus began to appear. I told him that if he had a patient with the same trouble in the foot he would call it gout and treat for it accordingly. He took my advice, and when I saw him about a week later he had the trouble well under control, it continued to improve from day to day. He told me that he found that his whole system had been filled with uric acid, and in future he would profit by his experience not only with himself, but with his patients as well.

CASE III.—Mrs. D. has been treated for pyorrhœa for ten years, about every three months either one tooth or another, losing one occasionally until three or four years ago, when the remaining ones were extracted. She exclaimed then, "Now I will have comfort." Soon after this she had an attack of gout, for the first time, and

has continued to have attacks from time to time ever since. I have heard her remark several times since the extraction of the teeth that she did not know which was the worse place to have it, in the jaws or in the feet.

CASE IV.—My wife for the past few years has been going through the usual symptoms of a true case of pyorrhœa. In this case there have been from two to four attacks a year, first on one or two teeth, then a change to another location, which keeps you and the patient discouraged. For the past year, with the salicylate of lithia given as soon as the first symptoms appear, I have been able to get complete control of the trouble, and, in fact, keep it under control.

CASE V.—A well-known surgeon of our city called to see me, saying that several of his teeth were so sore that it was with great difficulty he could masticate his food. Upon examination I could not see anything special, and treated with aconite and iodine. This condition remained about the same for a few days, and not gaining the headway to suit me, I made an examination with a powerful light made for the purpose, and found that the antrum on one side was badly congested. I diagnosed it stasis from uric acid, and advised salicylate of lithia or any treatment he thought best for that trouble. He followed directions and secured relief at once. I saw him some time later, and he told me that he should continue the treatment, as he was having a little rheumatism.

Dr. Raymond.—Dr. Bierwirth has covered the ground so fully, and given us so much for careful study, that I, for one, feel under obligations to him for his valuable contribution, bearing upon a subject of such importance to us. Patients who come under our care with marked uric acid diathesis not only require our mechanical skill, but the ever-present enemy, uric acid in the blood, must be attacked through general systemic treatment if we would save the teeth at all. In cities and towns where people of this peculiar temperament get little pure air or exercise, and are large eaters, it is almost impossible to prevent the erosion around the necks of their teeth. If the kidneys are unable to carry off the uric acid which is found in the liver, the blood will naturally convey it through the system. You will find on the surface of the skin little pustules containing uric acid. An examination will reveal crystals of this acid. If you will put the end of your tongue on the inside of your lip, you will feel very plainly the mucous glands

or follicles. It is well understood that these glands are receptacles for uric acid, and this passing through the ducts of the mucous membrane on to the necks of the teeth causes much of the erosion which we meet with by its solvent action upon the phosphates and carbonates of the enamel. Our duty in such cases is to prescribe constitutional and dietary treatment. Pure air and golf will be better than massage and poker, which many deem apparently an efficient substitute for healthful exercise. Cervical decay, however, is not always due to the action of uric acid. I have seen marked cases where there was no tendency to uræmia in any of its phases.

Dr. J. W. Canady.—It is a very large subject and one on which a great deal can be said. I believe with Dr. Parker that the treatment of these obscure cases of erosion should be more systemic than instrumental.

Dr. Charles J. Meeker.—There is one question that I would like to ask Dr. Bierwirth. I may ask it by citing a case in my own practice. It is that of a lady thirty years of age, who has been in my charge for twenty years and has always been in excellent health. She has within the last six months developed enormous quantities of tartar. Is this any indication of uric acid poisoning? How would Dr. Bierwirth look at this from a physician's stand-point?

Dr. Bierwirth.—I think that in this case there would be indicated perhaps a disease of the glands rather than any constitutional disturbance. Certain forms of anæmia may also be the cause. There are so many conditions which might cause this trouble that it is hardly safe to say which was the cause in this particular case.

The President.—We have been much favored and instructed by this paper of Dr. Bierwirth's, and I am sure that we as well as the larger number who will read the report of this meeting will profit by what he has said. It is a field in which we are happily beginning to learn, and of course our minds revert naturally to the paper which Dr. Michaels, of Paris, sent us somewhat over a year ago, and to the recently published synopsis of a paper that he read before the International Congress at Paris last summer. Dr. Michaels has attributed certain variations of the chemical composition of the saliva to the uric acid diathesis, and erosion of the teeth and other lesions are due, in his opinion, to abnormal quantities of the sulphocyanides and other constituents. This paper

of Dr. Bierwirth's is undoubtedly going to be of great help to us in understanding this subject. I was impressed, in referring to Schafer's recent work on physiology, by the statement that the amount of sulphocyanates in human saliva varies from 0.014 to 0.00016 per cent. In the "American System of Dentistry" the analysis of Bidder and Schmidt place it at 0.006 per cent. So we see what a delicate undertaking Dr. Michaels has had in hand when seeking to determine for individual patients variations from the normal amount of this constituent of their saliva.

Dr. Bierwirth.—I would like first to answer the questions which Dr. Kimball has sent me.

1. Pyorrhœa alveolaris, chemical erosion of the teeth, decay of teeth, and recession or atrophy of the gums have all been observed to be associated with the uric acid diathesis. Yes.

2. Dr. Peirce, of Philadelphia, has said that hard deposits form on roots of teeth, composed of urates, before any opening connects the point of deposit with the surface.

I take exception to this, as I contend that it is impossible to know whether there is a microscopical opening or not, and also on the ground that it is inconsistent, but mainly for the former reason.

3. Dr. Michaels, of Paris,, claims that dental lesions, erosion, and caries are results of discrasia. Shown by analysis of saliva as well as of urine. He says where ammoniacal salts exist in saliva in excess of sulphocyanides dental caries is in active progress. When sulphocyanides are in excess of ammonia salts, caries is checked, but in this condition, if potassium is in combination with sulphocyanides, erosion takes place. In a healthy state of the system he says the ammonia and sulphocyanides are in equal proportions in the saliva and in small quantity. Excess of sulphocyanides is characteristic of hyperacidity (arthritis).

I believe this is fishing for the unknowable. The saliva is an alkaline fluid which is poured out in enormous quantities. It contains normally always the sulphocyanide of potassium. All the analyses that I have ever seen have contained a certain amount of this salt. Now, this has been variously given as from 0.05 per cent. to 0.006 per cent. A great deal depends upon the means by which the saliva is collected. It would seem, in that the sulphocyanides are always present, that if this salt causes erosion all the teeth in the mouth would soon be lost.

4. Would an analysis of saliva furnish a basis for diagnosis of general conditions?

I do not believe it. I wish to modify that a little. I do not believe that the saliva has any other function in the human system except to act on raw starch and to act as a lubricant. There has been a great deal of controversy as to whether the ptyalin has any action after it reaches the stomach. I believe that the latest authorities state that in the stomach its action is merely inhibited and that it is continued in the duodenum. I cannot bring myself to the belief that the saliva has anything to do with the caries of the teeth. If so, we should have a great deal more than we do have. It is a perfectly bland fluid. It may be changed more or less by disturbances of the stomach. I think the way most chemical processes are set up which destroy tooth-structure is by the retaining of food between the teeth, producing a focus of sufficient strength to attack the enamel of the dentine below the enamel. I simply reason this from the stand-point of a physician and a chemist. I believe this acts in combination with a lowered resistance of the tooth itself, although this is not necessary and the process may be purely chemical, as we all have seen apparently perfectly healthy persons who take good care of their teeth and yet every tooth has a filling in it.

And so I think, in searching for a logical and scientific cure for caries of teeth we must always bear in mind that there is a lowered resistance in the tooth and a local focus, which has acted upon that spot.

Dr. Kimball.—I wish to express, on behalf of the Executive Committee and the Institute, our pleasure and thanks to Dr. Bierwirth for coming over from Brooklyn to read us this excellent paper, and I move you, Mr. President, that the thanks of the Institute be most cordially extended to our friend. Seconded and carried.

I am instructed by the Board of Directors to make a report to the Institute.

REPORT BY BOARD OF DIRECTORS.

At the suggestion of Dr. Benjamin Lord, the first president of the Institute, and largely through his personal influence, a Special Fund has been established under the control of the Board of Directors of the Institute, for the purpose of promoting the advancement of the profession along lines of scientific research or investigation. This fund has been

added to by some of the members until it amounts at the present time to eleven hundred dollars.

Contributions of any amount to this Special Fund will be accepted with thanks, and suggestions will be welcomed as to the most effective use that can be made of it for the purpose stated.

Dr. E. A. Bogue.—I would like to ask Dr. Bierwirth one or two questions:

1. Whether he would consider the condition which he has so graphically described to us in his paper as having any bearing whatever on diabetes?

2. Whether it would be possible for the liver to produce more sugar that was wanted and eventually discharge it through the salivary glands into the mouth, if not in the form of sugar in the form of glycogen?

Dr. Bierwirth.—In answer to the first, I hardly think so. As a rule, in diabetes there is no congestion of the mucous membrane, although congestion may come subsequently. Of course, diabetes may cause it, but I doubt it very much.

2. I do not believe that this is so. I have too much faith in the perfect balance of nature. I think if anything of this kind could occur it would be readily recognizable, and think it would have been found out long since. I do not think much faith should be placed on laboratory experiments causing erosions, where the teeth are taken out of their natural environment.

Dr. Bogue.—There is one other question, whether either of these substances, sugar or glycogen, should they come into the mouth in this manner, could in combination with the ptyalin form an acid?

Dr. Bierwirth.—I do not believe that ptyalin has any influence on sugar in any way. Chemically considered, I do not think this is possible.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Boston, Wednesday evening, February 6, 1901, at six o'clock, President V. C. Pond in the chair.

President Pond.—The Executive Committee has departed a little from the usual custom to-night. They have a dental subject, but presented by gentlemen of another profession; certainly a subject in which we can all be interested, as dentists, as fathers, and as public citizens. I think it is a very good idea, quite a happy thought of the Committee. Perhaps we may have granted, in some slight degree, the oft-repeated wish "to see ourselves as others see us."

I have the pleasure of presenting to you Mr. G. E. Johnson, of Andover, Mass., Superintendent of Public Schools, who will read a paper upon "The Condition of the Teeth of Children in Public Schools."

(For Mr. Johnson's paper, see page 445.)

President Pond.—Gentlemen, we have listened to a very interesting paper, which gives many new ideas to us, and presents other ideas, perhaps familiar, yet in a new dress. I am very glad that the Executive Committee has selected one of our ablest members to speak for us. We will be glad to hear from Dr. Brackett.

Dr. Brackett.—Mr. President and gentlemen, I am much afraid that on this occasion, as on others, my place may be disappointingly filled. I find, perhaps increasingly as I grow older, I have had something of the difficulty all my life, that it is hard to see all of the arguments or all of the right on one side of a question. And this matter, as it has been put before us to-night, is a thing of such breadth and of such far-reaching consequence, and it is a matter to which I have given so little thought and attention, that I do not feel able to speak as I would like to speak upon it. However, there are in my mind many comments which I would like to make.

First, let me testify most heartily my grateful appreciation of the work of the essayist, for its intelligence and good sense. If the gentleman who has presented this paper had been not only a trained man in educational affairs, as he is, but had added to that

training in medicine, training in pathology, and experience as a practising dentist, you will all agree with me that he could hardly have put before us a more intelligently conceived and judiciously expressed article. Another point that is worthy of mention is the very great labor that a paper of this kind represents. He has modestly stated that it has cost time, effort, and thought in order to provide the data to give us a paper like this,—more work and more thought and more time than those of us who have not given attention to such things can fully realize.

Now, with reference to one of the points in the paper, for the sake of making a beginning,—the influence of civilization upon the physical make-up of the individual, including, with all of that physical make-up, the dental organs and their contiguous tissues. We are probably right in the generally held opinion that very many of the influences of civilization tend in the direction of physical degeneracy; and yet I do not think that idea is entirely correct, and I will give you something out of my own personal experience as a foundation for this faith which I possess.

I commenced my dental studies in the city of Holyoke, in this State, which has, and had at that time, thirty years ago this present year, when I went into the office of Dr. Taylor there as a student, a manufacturing population, partly made up of people that have not had the best opportunities in the world, not the best opportunities for physical culture, not the best homes, not the best environment, not the best diet, not the best education, not a large share of those possessions which are generally accounted among the good things of this life. They are often of a mixed parentage, French Canadians, Irish, etc., a commingling of different races, and as specimens among those races, as I have intimated, not of the best. Their material means for obtaining a generous diet were limited. Their intelligence of what constituted a diet with proper nutritious elements was limited. Their homes were not remarkable for good sanitary conditions, but rather the reverse. Working in-doors in a contaminated atmosphere, dwelling often in poor houses, with perhaps insufficient drainage, with crowding too many individuals in too small a space,—all of these circumstances together led many of them to be of small stature, of pallid complexion, and radically different from the people who come of different stock and who have lived in a different environment.

With all the rest of the physical lack, there was a most deplorable condition of the teeth. It was no uncommon experience to have children brought to the office, four, five, six, eight, or ten years of age, presenting little more than a mass of decay, hardly a tooth in the whole denture in a healthy condition, a simple aggregation of pathological expression. In some of the worst instances a large share of the deciduous teeth had lost their crowns from caries at the age of four, five, or six years, while the investments of the teeth were in such a pathological state as you can perhaps imagine. It was not an extremely rare thing among these people to find artificial dentures, nearly or quite complete sets of artificial teeth, worn in the mouths of young girls sixteen to twenty years of age. There were instances of entire upper sets being required at the age of sixteen years.

Without spending too much time upon these details, I had the opportunity to observe a very marked contrast in physical expression and in quality of the teeth in my subsequent experience in Newport. There are in Newport, among the summer colonists and among the permanent residents, a class of people diametrically opposite in their material means, in their intelligence; and in their environment from this class of people of which I have been speaking; people coming from the best ancestry, people whose mental power and physical vigor have been for generations such as have given them a foremost position among their fellows, people who have accumulated very large wealth, and who have, associated with the possession of wealth, the best and brightest minds, the best good sense, and the most intelligent capacity with reference to the rearing of their children. With this good sense and with the ample material means, there exists a condition of things that is distinctly opposite in the premises from that which I have just described; and opposite, as you would suppose, not only in the premises, but opposite in the results. The boys and the girls, the young men and the young women, that are growing up are among the very best specimens of American childhood, of American manhood and womanhood, physically speaking, morally speaking, and intellectually speaking, that are to be found in our country. It is not a very unusual thing to find in the mouths of the children of some of these families teeth absolutely perfect and mouths the picture of health during all of the period of the presence of the deciduous teeth and subsequently. I have many times

seen children of these families that never had any caries of the temporary teeth, and that, as the years passed by, had only a limited amount of caries with the permanent teeth. Of course, there are marked exceptions to this rule; there are some families in which caries occurs to a very considerable extent. But, as a rule, in this case, as the rule was in the manufacturing population of lesser advantages, there is a diametrically opposite condition of things existing in consequence as there was a diametrically opposite condition of things in the premises.

We had before us an essayist, whom some of the older members will surely remember, quite a number of years ago, Dr. Stollwagen, of Philadelphia, who read a paper whose title I do not remember exactly, but it had reference to the connection between children going barefooted and the good quality of the teeth; the idea being that those children who come up barefooted, with all which that implies of open-air exercise, of rugged sports, of a good appetite and a nutritious diet, with plenty of hours of sleep, and a strong, vigorous digestion, were of the sort who would have associated with all of those things a good quality of teeth. And so, through these different links of the chain, there was a direct connection between going barefooted in childhood and a good quality of teeth in the mouth of the child.

So this is one point to which I am trying to come, that there is not necessarily associated with the accumulation of wealth, and with its refinements and luxuries, physical degeneracy. A good deal of the physical degeneracy comes in from circumstances that are not necessarily a part, and really are not a part of the best-lived life under the very highest civilization.

There are other points. As I turned the subject of this evening over in my mind during recent weeks, I questioned what was a practical thing to do in connection with this great problem which is before us, and then I questioned, what has been done in the past in the way of compulsion, or in the way of State regulation in any line, that can have comparison with that which we are discussing. And these several points come to my mind; for instance, prominently, the matter of vaccination. The State says to the child, you must be vaccinated against small-pox before you can even become a member of the public schools; and it says that wisely, and it has said it a long time, and it has said it pretty universally, and it stands to that position.

The State takes another position, and it says that if you are ill with a contagious disease of grave moment, you must be isolated so that the chances of spreading that contagious disease shall be minimized; and public sentiment supports this position.

Of course, there are instances of objection in the matter of vaccination, and there are instances of very decided objection in some localities, but it is rarely intelligent objection. Those who have been students of the history of the ravages of small-pox know that before the introduction of this safeguard against this disease, communities were decimated, and tens of thousands of lives were sacrificed needlessly, as they could not be sacrificed under conditions existing to-day. The State is justified in assuming this position.

The State makes other prescriptions. It requires that the growing generation shall be educated, that it shall not grow up in ignorance. It makes education very largely a matter of compulsion. It enacts sumptuary laws, and it says that the traffic in intoxicating liquors shall be limited or shall be prohibited, or shall be a matter of regulation in varying degrees and with various modifications in different localities at different times. It directs that the pilot of a steamship, that the engineer of a locomotive that is drawing a passenger train, or is engaged in traffic of any sort, shall be capable of distinguishing the danger signals. It says that the responsibilities of certain positions are such that only men who have demonstrated their capability shall be permitted to fill them.

In all of these things up to this point, and in some which I have not mentioned, there is to be urged the fact that these positions are taken, this legislation is had, this rigidity is maintained as a matter of self-defence. We say we will not have the whole community subjected to tendencies in a wrong direction, in a harmful and pernicious direction, from the ignorance of the rising generation, or through use, or use which can be controlled, of intoxicants. We will not have the health and the life of the community endangered by unnecessary spread of preventable disease. And in all these particulars there are the strong arguments of self-defence. The community takes all of these positions, and maintains them, as a matter of self-defence, all shutting the door against the inroad of that which may be most destructive to the mass of the people.

And then we come into a somewhat different field of legislation, in which the individual, the well-being of the individual, is considered rather more, and there is less of the principle of self-defence involved. We enact laws against the adulteration of food, against the admixture of harmful substances, or against weakening of strength, or the admixture of some substance which, if not harmful, is in the nature of a fraud. We require that various articles which are sold as food-substances and as medicinal substances shall be kept to a certain standard, or shall not be adulterated or sophisticated. In this we are not protecting the mass of the people against possible harm in just the same way that we are protecting them against possible harm when we isolate a case of small-pox; the case is somewhat different.

Then we go into another field of legislation where perhaps more of that which is rightly denominated paternalism obtains; and that is in requiring evidences of capacity of certain men in certain responsible positions who minister to others. We require that the man before he practises at the bar shall give evidence of his fitness, in a way to satisfy those who are judges of such things; and that the man who is to fill the place of a minister shall also come up to certain requirements; and in recent years we have required that practitioners of medicine and practitioners of dentistry shall be qualified for the intelligent and beneficent pursuit of their callings.

One of the foundations upon which these laws regulating the practice of medicine and the practice of dentistry rest, and a precedent which affords a strong argument for us in obtaining legislation in these fields, was the pharmacy law. Here is a case where the State steps in decidedly between the incapable practitioner of pharmacy and the individual who might possibly be harmed or is likely to be harmed in his life and health. Among the oldest of this class of laws on our statute-books, and justly so, are the laws regulating the practice of pharmacy. Filling prescriptions often involves the use of ingredients of a nature harmful, or even deadly if not judiciously compounded or if without proper directions as to quantities and intervals of repetition of dose; and the law rightly requires that this responsible work shall be done only by those whose capacity and care have been tested and certified.

In all these things the State is not only protecting itself;

society is not only standing as its own protector, *en masse*, but it is doing something for the safeguarding of the individual, upon the theory that the individual is not well qualified in certain matters to be his own judge of that which is appropriate and for his advantage.

But now it seems to me that in this matter of looking out for the care of the children's teeth we should be going still farther in the direction of paternalism, and in safeguarding and helping the individual, where, in a sense, the individual interest is a large part of the interest. It is not a very dangerous thing to your family or my family that the teeth of still another family in the neighborhood are carious and are without attention. The matter is different for society, for instance, from the matter of the selling of tobacco or cigarettes to minors. There is an instance where society justly takes a position for its self-defence and for the well-being of succeeding generations. The boy who before the age of puberty, and at the age of puberty, is using tobacco is not only harming himself, but he is submitting his physical system to an influence that very probably will be manifest in succeeding generations to the disadvantage of the race. It is true that something of this obtains with reference to dental matters, as the essayist has stated, but probably to a less extent, although any legislation upon the subject of making anything in the way of the care of the teeth compulsory has to stand upon a narrower foundation than does legislation such as I have suggested.

I am indebted to the chairman of the Executive Committee, Dr. Eddy, for putting in my hands considerable literature as to that which has been accomplished in other places, and as to that which is now being done in different parts of the world bearing upon this matter. One periodical, a copy of which Dr. Eddy has placed in my hands, gives an account of the report of the committee of a Chicago dental society who sought to obtain from all of the cities of the civilized world with a population of a hundred thousand or over, statistics as to what is being done in this direction. From about half they received no reply. In more than half of the other half nothing was done. But in some few places something was done, either in the matter of lectures, or efforts to educate the people in one way or another, and in quite a number of localities efforts had been made simply to learn the condition of the teeth of the children in public schools. These efforts have been made in

Sweden, in Japan, in Belgium, in Germany, in France, and some initial steps have been taken in two or three of our Western States, Minnesota (the city of Minneapolis), Indiana, Iowa, and in Canada; but almost without exception without getting at the practical accomplishment of anything to combat the existing condition of things. The Germans, with their love for science as pure science, have limited their efforts to the collection of statistics, to learning existing conditions. A few other countries or localities have gone beyond this. Belgium, I think, in some of its larger cities employs authorized dental examiners, who perform dental operations, with the approval of the parents, for children in the public schools. But it still remains true that at the present moment, throughout the civilized world, very little is being done to combat diseases of the teeth and for the benefit of the mouths of the masses of the children.

That his condition of things does exist none of us needs any evidence to prove. A grouping of a considerable body of statistics shows, what every one of us in this room would know out of our own experience and out of our own information, that ninety-seven per cent. of the teeth of our children in the public schools are considerably diseased.

We might put with that another great fact, and that is that there probably is not ten years in the life of the individual when careful, judicious dental ministrations can accomplish more for good than in the years usually devoted to obtaining an education. I suppose that if an individual could have the best care of the teeth for only ten years of the lifetime, that ten years could be most profitably chosen in the interval from the age of six to sixteen, or eight to eighteen, or thereabouts.

Therefore, of the presence of the evil there can be no sort of question. It is an enormous thing with which we struggle, and without the advantage, without the strong arguments, without the helps that there have been in most other matters of the sort that have been ameliorated.

The chairman of the school board in Newport, Dr. C. F. Barker, an earnest and judicious man, has been for a number of years seeking to get adopted in our Newport schools a reasonable suggestion, and as yet without success, that there should be a medical inspection, at short intervals, of all the pupils of the schools upon the basis of the general welfare of the whole. There is no

doubt that if the pupils in public schools were inspected by a competent physician once in two weeks, he would be able to say to this pupil, "You have symptoms of measles, or scarlet fever; you should go home and stay until this has been investigated;" or, "You have mumps;" or, "You have whooping-cough;" or, "You have parasites in your hair, or ring-worm;" or he finds some other disease which threatens not only ill for the pupil affected, but for other pupils in the schools. This suggestion, which is one of the most sensible suggestions that could be made, and for which great argument could be brought to bear, has thus far failed of adoption. I question if that idea is practised in very many of our States. Probably these gentlemen here, connected with school boards, could say whether anything of that sort is being done. Probably they will tell us later. But if there is difficulty in accomplishing so much as this, there would be difficulty in accomplishing very much in the way of compulsory care of the teeth. Another obstacle in the way is that very many families lack not only the appreciative intelligence, but they lack the means to have the work accomplished, unless it were done at the public expense; and in the present state of the public mind there would be little hope of an appropriation of public money for the care of the deciduous teeth or the permanent teeth of the children in the schools. There is perhaps a little encouragement to be found in the legislation just now accomplished after years of struggle, to provide the army with a small number of dentists.

A considerable employer of mere manual labor, that involved no great intelligence, told me some years ago that quite a share of the men in his employ, men with families, having house-rent to pay and provisions and clothing to buy, and all the necessary expenses that go to the support of a family to meet, did not earn more than two hundred dollars each in a year. They were men that were not of the ambitious sort; perhaps they did not seek to get all the work that they could get; but even with a considerable disposition to be employed, the work being out of doors, and not work to be pursued in winter when the ground was frozen, their income did not exceed two hundred dollars a year for the support of their families. Well, that cannot pay for very much dentistry.

It cannot be urged at any hearing or before any committee to investigate the subject, as an argument for the adoption of anything compulsory for the care of the teeth, that it would furnish

employment for dentists. To such an argument objection would be made. The State is justified in following out this line of self-defence in a time of hardship, in a time when a good many people are out of employment, if the weather is inclement, and the times are hard, and for various reasons many people are idle, the State is justified in undertaking enterprises with the prime object of carrying them forward simply that otherwise unoccupied men may be employed, and that tendency to crime may be thus combated and repressed. The State is justified in doing that. It is not justified, except as a matter of self-defence, in giving any class of people who are not in a needy condition employment.

So that it seems to me, without continuing my remarks more than a few moments more, that a large part of what we can accomplish in the present must be here a little and there a little, in missionary effort, in cultivating a better intelligence and a better sense; and we are not without encouragement. We see progress as we watch succeeding generations of those who have come to this country. The first generation perhaps has come from a region where the advantages have been most limited, their mental caliber, their education, their material possessions, all of the most meagre sort. They have come here, and in the remaining portion of their lives have markedly improved their condition. The succeeding generation begins quite as far along, even farther along, than the old people left off, with better education, better intelligence, better appreciation of that which is helpful and advantageous for them, with more of an ambition to occupy a worthy place in the world, and their attainments are very decidedly in advance of those of their parents. In another generation or two they will take a still more advanced position, and they follow the plans and avail themselves of the advantages which a still better intelligence and more ample means enable them to command.

There must yet be some generations of school children that will not have all that we would desire them to have in the way of dental care; and it is incumbent on us to help on the good day so far as we can by such means as are justifiable when there shall be an amelioration of the deplorable condition of things which now exists.

President Pond.—We have other gentlemen who have certainly had a long and varied experience with school children, immense numbers of them. Whether they have devoted great thought to

this special line or not I do not know, but I trust they will give us some of the results of their experience. I would like to ask Superintendent Seaver, of the Boston Public Schools, if he will say a few words.

Superintendent Seaver.—Mr. President and gentlemen, I was glad to receive an invitation to come here to-night, and I am very glad that I came, for I have listened to one essay and to one speech which together certainly have set me to thinking. I must despair, in the first place, of the hope that I may add anything of value to the discussion; but if what has been said has set me to thinking a little, and set me to forming the determination to do something, perhaps my being here will not be altogether in vain. I cannot help being impressed with the importance of the subject, after the able setting forth that it has had this evening.

In casting about for a few of the possibilities of doing something, it has occurred to me that, in this city, we have already in operation a system of medical inspection of the schools; and it is possible that this medical inspection might be turned in some degree towards the care of the teeth. If Dr. Durgin, Chairman of the Board of Health, who devised this system of school inspection that I speak of, were here, he might be able to say whether the twenty or thirty doctors under his direction visiting our schools daily have paid any particular attention to children's teeth. I am very sure they have paid particular attention to many things outside the list of contagious diseases. They have aided a great many children and a great many families in useful ways with reference to the care of the children, their health, their nutrition, their habits in various ways; and I should expect, if I asked him the question, that he would say that something has been done, in a general way, with regard to the care of the teeth, but I am not aware that he has collected any statistics on the subject. Certainly, in his reports to me, I do not remember that "caries" occurs in the list of diseases which the doctors have found.

I watched the operation of this system of medical inspection of the schools with a good deal of interest for several years, and I am convinced that it is doing a good and a very important work; that in a general way it is doing something to protect our children from the ravages of serious diseases and from the inconvenience of the minor troubles. There has been from the first down to, I might say, the present time a very troublesome amount

of prejudice, active prejudice, and inertia, which may be called negative opposition, to overcome. The visiting physicians have been opposed in their efforts to secure proper attention to the children, from the parents and from the family physicians. This opposition shows itself in various ways. The visiting physicians, however, being for the most part skilful and tactful men, have overcome this opposition to a very encouraging degree.

I may illustrate how it happens that this opposition arises in unexpected ways. Only two or three weeks ago the principal of a school told me that the teachers in one of the primary schools in his district were very sure that it would not be worth while to bother the children and interrupt the school work by affording the visiting physician an opportunity to examine the heads of the children for the presence of small creatures which are troublesome. The teachers were quite sure that the children did not need any such examination as that. They could think of no arguments which would justify the interruption of school work that would be entailed if an examination should be allowed. But in the course of a few days three of these teachers found arguments, not *in* their heads, but *on* their heads, and they sent word to the principal of the district that, on the whole, it might be well for the doctors to examine the children's heads. In that school something over seventy per cent. of the children were found to be in trouble. They were all given a simple prescription and told they must use it before coming to school again. Thus the conservative opposition of the teachers was overcome.

One of the visiting physicians, Dr. Arnold, of Roxbury, said in one of his reports that he found marked symptoms of scarlet fever, and he told the child that he must go home and report to the parents the state of the case and ask to have the family physician called in. The child returned to school the next day, stating that the mother had declared that there was nothing the matter with the child: it might be a case of German measles, or it might be nothing at all, and that the child must be allowed to remain in school. The child was sent home again, and the visiting physician happened by accident to meet the parent, and then ensued a scene, scolding on the one side, gentle, scientific expostulation on the other, with the result that the family physician was called in, and the child was declared to be coming down with the scarlet fever.

The opposition manifested by the parents has often been serious

and a good deal of trouble and inconvenience, but, as I have said, that has been more and more overcome as the years have gone on.

I can say I do not believe that the medical inspection now carried out in our schools is as thorough, systematic, and scientific as it ought to be. At the same time, I fully believe that a great deal more has been accomplished than we might have the right to expect from the expenditure made upon it by the city. These physicians are not properly compensated for their trouble, in money. The salary paid them is a mere honorarium; it is not in any sense a compensation. But these physicians are public-spirited citizens. They are willing to contribute of their time and of their skill generously to the public need, and from that spirit we are reaping a very large reward. We are getting a great deal more than we pay for.

So in this matter before us to-night, if much is accomplished, it will have to be accomplished, in the first place, by public-spirited physicians, by public-spirited scientific men, who will give their time and skill for the public benefit without reward, or, at any rate, without adequate reward, save that of the satisfaction of having done one's duty to the public in some degree well. As the essayist said to-night, the dentists in Andover have contributed of their time and skill freely, and I have no doubt that the dentists of this city, if called upon, would contribute in the same generous way.

I believe that this system of medical inspection, which we have only started in Boston, is destined to grow in the city of its first adoption, and to grow by spreading to other cities and towns, as it has already to a large degree, and that before the middle of the century we have just entered upon we shall have a thorough system of physical care of the children, which will include not only the care of the children themselves, but judicious and useful advice to the teachers; for you will find, gentlemen, that the teachers will be ready to co-operate. They will be ready and glad to receive suggestions and act upon them. What they ask for is the help that you can give. They need instruction in a general way so that they may be more ready and skilful than they are in discovering the first symptoms of the approach of disease, or of the presence of such things as deafness, abnormalities of vision, and imperfect teeth.

I remember an instance the other day which illustrates pre-

cisely what I mean. A child was reported to me as being mentally deficient and as a suitable candidate for special classes which I have for the treatment of mentally deficient children. I sent one of my experts to examine the child, and it was found that the child was normal, practically, but that it was deaf. The teacher had not discovered that fact; had not discovered that most of what was said by the teacher and by the other pupils in the room was not heard by this child. This child was, therefore, unresponsive, appeared to be ignorant, and doubtless was ignorant, but the cause was not a defective brain, but defective organs of hearing.

Another instance came to my knowledge in which a little girl had been recorded as a stupid child because, apparently, she had failed to learn what had been placed before the class day after day on the black-board. The child was so near-sighted that nothing written on the black-board could be perceived by her. The teacher had not discovered it.

Now, those teachers simply need to be told how to discover indications of that kind. The visiting physician oftentimes will, in a little talk, call the teacher's attention to the importance of looking out for these indications, and the teachers will always be willing to co-operate. It is not among the teachers so much as among the parents that the passive opposition that I have spoken of is manifested. It is true with regard to teachers, however, that they become so intensely absorbed in what they naturally regard as their main business, that they forget these things which look to them like side matters. I quite well remember my own case, as a young teacher, teaching classes in a room which was kept warm by means of an air-tight stove in which wood was burned. I used to become so interested in my lesson that I forgot to provide the stove with wood, and oftentimes my room became very cold: simply a case of absorption of my attention, which meant neglect of attention to other matters. So I suspect it is with a great many teachers. They are absorbed in what they for the time being regard as their main business, and forget these other matters relating to the health or to the physical condition of their pupils; and reminders from the medical visitors are welcomed, and they are important for the purpose of reviving attention to some other matters besides the main business.

President Pond.—The town of Brookline has a reputation of doing a great deal for the school children, perhaps going rather

farther than many communities do in many directions. We have the Superintendent of Schools in Brookline with us, and I hope Mr. Aldrich can give us some information, something new, it may be, of something being done in this line. I have the pleasure of presenting Mr. Aldrich.

Mr. G. I. Aldrich.—Mr. Chairman and gentlemen, I listened with great interest to Mr. Johnson's essay. So far as I know, he is distinguished as being the only school man who has turned his attention to this particular line of thinking. As I listened I could not help wondering if he did not possess some technical knowledge in this particular matter, of which most school men are lacking. I confess that I should quite despair of succeeding as he has done in a personal attempt to learn in regard to the condition of the teeth of the school children of Brookline.

I feel as little sanguine as Mr. Seaver of contributing anything of value to the discussion; and yet it seems to me the outlook is not entirely a hopeless one. It is only in comparatively recent years that we have begun to pay very much attention to the bodies of children, to their physical well-being. Perhaps we have done rather more in the education of public sentiment than we have along the lines of positive accomplishment, and yet we have begun to surround ourselves with a good many improvements. We have educated public opinion, and in some degree this public opinion has found expression in legislation in regard to such matters as adequate floor-space for each occupant of a school-room, adequate cubic space. We are paying attention to the quantity of fresh air for each occupant of the room, and for suitable means of exhausting the foul air and supplying fresh. We are paying attention to the best means of lighting.

Then we are doing something, as has been said, along the line of school inspection. In the city of Newton, I remember, a few years ago the local board of health attempted three set medical inspections per year,—that number, simply because their funds did not allow them to undertake anything more,—but at the opening of school in September, then again after the Christmas holidays, and a short time after the Easter recess a corps of physicians went through the schools examining each pupil. The hands were examined to see if there was anything which indicated the presence of a cutaneous disease; the tongue was tested; the head was quietly examined; and I have no doubt that a medical inspection

which was no more thoroughgoing, and which occurred with no greater frequency, amply paid for itself.

Along that line in the town of Brookline even more has been done, especially at times when there seemed to be a threatened epidemic of diphtheria. I am unable to say how many cultures have been made from the throats of school children, but a great many, and in a certain section of the town, a less favored section, where diphtheria seems to be almost endemic, that work has been most thoroughgoing.

But leaving those general matters, and coming a little closer to the theme of the evening, the question arises as to what may be done, and how it is to be accomplished. If I understood the essayist correctly, he hinted an opinion to which I should agree, and that is that the initiative will have to be taken by the dental profession.

As you are all aware, we have been a good deal afraid in this country of anything that savored of paternalism, and perhaps that is, after all, a rather sound feeling. I chanced to pick up a book a few days ago—my attention was attracted by the title—which was marked "Newest England," and I found it to be an account of the Australian colonies of England. To us the enterprises upon which the government has entered there, in New Zealand particularly, are very interesting and very startling. It may be urged that time has not yet elapsed to make it evident whether these enterprises are going to be successful in the long run. Certainly time has not elapsed to make it evident what the effect upon the people subjected to these various enterprises is to be; but I think we are safe in assuming—indeed, our practice during recent years makes it evident that we are getting away from that bugaboo of paternalism—that we are disposed to do more and more, to undertake in greater degree those measures which count for the welfare of the body politic.

It may be interesting to notice in this connection what can be accomplished by people who are full of zeal, even though their zeal sometimes outruns their discretion. We have in Massachusetts—have had now for a good many years—a law which runs to this effect, that instruction in physiology and hygiene, with special regard to the effect of stimulants and narcotics, shall be given to all pupils in all schools. That was brought about by the temperance workers. There is a sharp difference of opinion between this body

of temperance workers and the medical body and the school people as to the wisdom of the precise methods which are attempted. I only mention the matter as indicating what can be accomplished by a body of people who are very much in earnest in regard to a given matter.

Suppose we come to this matter of the teeth. I suppose it is merely another illustration of the fact that in order to accomplish anything in a society organized as ours is, the first thing is to educate public opinion. You must impress the people with the gravity of the situation, the need of doing something. It is probably true that the average teacher knows just about as much—or just about as little—as the average superintendent of schools in regard to the general matter of the teeth of the school children. I suspect up to this time they have attracted very little attention. But teachers are an intelligent body of people, and they are very quick to respond to the need which is pointed out to them. As Mr. Seaver has said, they are, and perhaps very properly so, concerned with the main issue; but I do not know of any body of workers that is any more ready to do work in the missionary spirit, if they become convinced that by undertaking that effort they can really serve the public good.

And so, following out the suggestion of the essayist, I see no more hopeful line of approach than that one dentist, or two or three, or all the dentists in a community, should undertake to awaken and enlighten public opinion in regard to this matter. From people who lack charity, from narrow-minded people, you would no doubt hear suggestions that it was self-interest, or some other rather low motive that underlay the action, but I think we can afford to ignore criticism of that sort. And I doubt if any one of us could safely undertake to put bounds to the good which might be accomplished locally if the members of the dental profession were willing to enlist in such undertaking. It would be quite easy in any community, for instance, to get an opportunity of addressing the assembled teachers of the town or city, and that would seem to me a very suitable place in which to begin. And then quietly, indirectly, it would be quite in the power of teachers to influence a good many homes.

I have been many times surprised that in cases of children who were abnormal in the matter of sight and hearing, that fact had not been discovered by their parents. You would suppose the

parents would be the first to learn of it; but those who have had to do with schools would be able to point out many instances in which the attention of the parent had been called to the fact that his child was in need of glasses, or treatment for the ear, in order that he might profit by attendance in the school. Working along that same line, I think a good deal might be accomplished in this particular direction,—viz., the care of the teeth. But evidently the land is an unknown land to us at present. It is a matter which, as I think Mr. Johnson's paper indicates, has attracted almost no attention. I confess that until I had the notice of the meeting for to-night I do not know that my own attention was ever called particularly to the matter. Somebody has pointed out three stages through which public opinion goes. He says in the first place there is the unanimity of the ignorant, then the disagreement of the inquiring, and after that the later unanimity of the wise. I take it that we are at the first stage of these three. There is at present the unanimity and the indifference which usually attends upon ignorance, the unanimity of the ignorant. The next step will be to precipitate the stage which involves the disagreement of the inquiring. We must be prepared for a good deal of opposing opinion. It will be hooted as nonsense in a good many quarters. I take it, however, that it is not at all visionary to hope for a time to come when into the purview of the medical inspector will be taken this matter of the care of the teeth. And as long as physical well-being and happiness in this world generally are so dependent upon physical conditions, it seems to me a matter which is well worth the attention of all of us.

I think, Mr. Chairman, that this is the only occasion on which I ever looked forward with pleasant anticipations to meeting a company of the dental profession. I did not know that this penalty of after-dinner talk had anything to do with the dinner. If I had, my anticipations would have been less pleasant. You are all accustomed to say, "Open the mouth, please," and so there has seemed to be nothing for us except to respond to your invitation.

President Pond.—A great many allusions have been made to-night to the physicians and their duties and work in this subject, and the help that they can give. We are fortunate to-night in having with us a gentleman who is a practising physician, and who has also had a good many years' experience on the school board,

and perhaps he can fill a link in this discussion. It gives me great pleasure to present Dr. Green.

Dr. Green.—Mr. President and gentlemen, it seems to me that this association has already begun its good work. It certainly has succeeded in interesting our two friends on the left of the president, and it is to be hoped that the good work has begun through their interest in reaching teachers and parents, and ultimately the children.

It is a subject that interests me, and always has interested me; and I have been very much interested by the very carefully, elaborately prepared essay of the evening.

Now, the practical point—which I think most Yankees like to look at—is how to accomplish the work which everybody here realizes should be accomplished. I think that has been very carefully pointed out by the two superintendents of schools. They have shown us the avenues of approach, so to speak. The parent has got to be reached. The child has got to be reached by them, although probably through the teacher very largely. And then, finally, the dental profession has got to be reached, and they have got to be the ones that must reach the others, it seems to me.

Now, you know that doctors give away a large amount of their time. I am not here to sound the praises of the medical profession; but I am stating what is a well-known fact when I say that they do give away a large amount of their time, especially in cities where there are hospitals and dispensaries, to the gratuitous treatment of the sick. You know, too, that there is going out in this community a strong desire that the dental profession shall become more unified with the medical profession, that dentists shall be doctors of medicine to begin with, and that dentistry shall be their specialty, just as diseases of the skin or of the eye may be the specialties of other doctors. It is believed that dentistry should be a liberal profession; and I suppose one of the characteristics of a liberal profession is that it gives itself largely, without recompense, to the general good of the community.

Now, there is the opportunity for the dental profession, in becoming more and more a liberal profession, to do a great public work in just the direction which the essayist of the evening has shown. How can it be done? In the large cities,—take, for example, in Boston,—we have here one—I believe there are others—dental school, and in their clinical teaching they do a large amount

of gratuitous work among the poor. But I imagine, although I have not definite knowledge to that effect, that children constitute a very small part of the patients. At all events, certainly in Andover, there are still many children who need the gratuitous service of a dental clinic.

Now, why should not there be in all the larger cities, in all towns, an opportunity for the children of the poor to be gratuitously treated? Why should not the dentist do as the physician does, give some of his time, even if there is not a dental school in his community, towards taking charge of these children of the poor?

That is one way in which the dental profession can become more and more a liberal profession. When such a clinic is formed, why should not it be found that these clinics would attract dental students who would come to this little coterie or gathering or society of dentists who have come together to form a free dispensary? Why should not dental students come to them for their dental teaching? It seems to me that there is an opening for dentists to become professors of dentistry, although not connected with a large dental school.

Then again, dentists can reach the parents, as the essayist of the evening has said, through talking to mothers' clubs. I am very sure that a great deal of the time of women's clubs must be spent much less profitably than in listening to the instruction of the dentist in pointing out this condition of affairs in regard to the care of children's teeth. If the parents can be thus interested, their objections can be removed.

Then, again, the teachers can be reached. There are teachers' meetings in all the counties, if not in the towns, certainly once or twice a year. Why should not a dentist be chosen among the fellows of his society in the different towns to speak to these teachers, and to say to them just what the essayist of the evening, Mr. Johnson, has said to us to-night, and inform them?

Now, a teacher may not be able carefully to examine the children's teeth; but the teacher can surely tell whether the children's teeth are clean. The teacher can find out whether that child has ever been taught to brush his teeth, and how often; whether, as one child said, he brushes his teeth only on Wednesday and Saturday afternoons and Sunday morning. I remember a teacher once in my hearing saying to a boy, "My boy, your teeth are not clean,"

and the boy looked ashamed. I have no doubt he attended to his teeth better after that. Teachers could be reached through these teachers' meetings, as we have been reached here this evening; the teachers could do a great deal without the aid of the medical inspector, and after they are interested they would be willing to help in this matter. Probably not half of the teachers have ever thought of this subject.

I do not know, Mr. President, that I can add anything to what I have said, but I do feel very much gratified to think that this subject has been considered here this evening. I do not know that it has ever been spoken of before. I have never heard it so fully spoken of before. And yet it is a subject I have long been interested in, as in all other things that affect the poorer classes. It seems to me that it must be a stimulation to every member of the dental profession here to-night to think what the possibilities are of doing a very great good in his community in taking the initiative in overcoming the obstacles in reaching the teacher, the parent, and ultimately the child, on this important matter.

President Potter.—The subject is open for discussion.

Dr. Potter.—I have been very much interested in the course of this discussion, especially in the closing remarks of Dr. Green. I thoroughly agree with him that the dental profession must liberalize itself by a free service to those who need it. It is very well for us to go before teachers and tell them that all poor children need the best of care for their teeth. What is the use of making this statement, unless we are able to meet their needs?

Their needs can be met in some places, perhaps, by the local dentists organizing themselves and giving a part of their time every week for the free treatment of such cases. In the large cities the dental schools can take a considerable share of this sort of work. We who are connected with either of the dental schools in this city know that many children are there taken care of; their teeth, which would otherwise go to ruin, are filled. If we can arouse teachers and parents to send poor children for dental treatment to places which are now in some places provided, we will accomplish much.

Dr. Ainsworth.—Two or three thoughts come to me in connection with this matter. In the first place, I wish to compliment the essayist on the ability he has shown in writing this paper. It seems astonishing that a man who has made no special study of

dentistry could put on paper the essay that he has given us to-night.

The next thought is that our friends outside the profession are perhaps inclined to grasp this subject a little too high up, not getting at the root of the trouble. It seems to me that we can reach this matter better through the gospel of cleanliness. It is an accepted fact, I think, that if we could establish perfect cleanliness, we should have very little decay of the teeth,—that is, teeth of the better quality. If we can instruct in the schools on these lines the importance of cleanliness of the mouth, we would save the necessity of much of the work and expense that comes later.

It is probably a fact that the mass of the poorer people omit having dental work done on account of the expense. Perhaps some think it is economy to omit the expense of a tooth-brush; if so, I think we might supply tooth-brushes to the children. But, at least, if we could reach the teachers, and impress upon them the importance of cleanliness of the mouth, that they may inculcate it in the minds of the pupils and awaken in them a little pride about their personal appearance, we should start the ball in the right direction.

There are very few people who understand that the loss of a tooth is anything more than the loss of a tooth. The sixth-year molars are the buttresses to the arch, and stand as a support to the rest of the teeth in the arch. Each tooth is necessary to the arch, more particularly, perhaps, the cuspid teeth, which come in when the others are in proper condition and key up the arch. Now, the loss of any one of these teeth results in a sagging in of the whole arch. Then that arch does not properly fit the other arch, may it be upper or lower, and in consequence it cannot perform the work that it is designed to perform to the same advantage. No one would think of competing, in a delicate piece of machinery, a pair of cogs with one tooth broken out against a pair where every cog was perfect. He might run the machine for an indefinite length of time, but it would not run with the same quiet ease that the one with the perfect cogs would. It would shake itself to pieces; it would shake the building down in time. And so with the teeth; if you lose one tooth from the arch, you have put that arch in a way to shake itself to pieces, and with it the whole system.

Then it seems if we could start in by teaching the gospel of cleanliness to the children, we should start in the right place.

Dr. Hulme.—In making that examination of the children in Andover, it was interesting to notice how interested the children themselves were in the examination. They, almost without exception, came to be examined practically without fear. As you know, children have a great dread of the dentist, but they came to us practically without fear, and were examined pretty thoroughly. They went home and told their parents of their condition. In some cases diagrams of their mouths were given them. They were taught what the marks on the diagram meant: cavities were marked in certain ways, good teeth were without marks, and extracted teeth marked in a different way, and so on. They were told when their condition was good, when fairly good, and when bad. They went home and told their parents. The parents were, of course, more or less interested, and in some cases it did a great deal of good; in others they let it drop as a thing to be put off until to-morrow.

If these examinations could have been carried on several times in the course of the year, I think they would have accomplished a great deal of good; simply the examination, and the instruction given to the children and carried home to the parents. You can interest the parents only by interesting the children, and not in the other way, by reaching the parents first and the children afterwards. You must reach the children first, and if the children's teeth can be saved through their own interest in them, the parents are perfectly willing to help all they can. Of course, they had a dread of the filling of their teeth,—that has been drilled into them from time immemorial,—but after a short time spent in the presence of the teacher and the superintendent they got over that dread enough to come, for the examination at least, without any great reluctance.

Dr. Smith.—I think one point is overlooked, in discussing the question,—namely, that gratuitous service to the poor on the part of the dentist means much more in a money way than gratuitous service on the part of the physician. The physician in making his calls upon the sick can, without much pecuniary loss, drop in upon a poor patient here and there. An hour of his time given in this way would enable him to see several patients. With a dentist it means much more: an hour of his time would hardly suffice for one patient. If the dentists in the town of Andover should undertake to properly care for the teeth of the poor chil-

dren in that town, they would have to relinquish their private practice.

As has been pointed out by other speakers here this evening, the two dental schools in Boston offer an opportunity for poor children to be treated free of charge. If some scheme could be put into effect by which the children would be obliged to show to their teacher a certificate from one of these schools stating that their mouths had been properly inspected and cared for, it would seem to me a step in advance. In my own clinic in the Harvard School we find too commonly, as the essayist has pointed out, that the first permanent molars are gone beyond any chance of saving, and the loss of these teeth is many times a serious matter in the treatment of irregularities of the teeth, entailing upon these patients very much more regulating than would be necessary were these first permanent molars kept in a good condition. As the essayist has well said, if we could only bring it about so that these children could be brought to these infirmaries while young, before losing their temporary teeth, and before the eruption of the first permanent molar, it would add much to their health, and avoid trouble.

Dr. Green.—Mr. President, I wish to add a word in reply to Dr. Smith. I am afraid he does not realize altogether what he says, when he says that the dentist would be giving more than the medical profession. I do not suppose that the public generally, and perhaps not the dental profession, realize what the men who work in hospitals do give to the poor. It is not, as Professor Smith has intimated, that the physician, making his round of visits, with his carriage, can stop now and then and make a call upon a charity patient. It is true, it would not take as much time as it would take a dentist to attend to one tooth in a poor child's mouth. But how about the surgeon, who spends the entire forenoon at the hospital? There are a good many surgeons who are on duty four months, certainly, in the year, and during that four months that they are on duty they spend practically the entire forenoon of every day, Sunday included. That is a pretty good part of the working year.

It is surely not a matter of a minute now and then, or ten minutes now and then, with surgeons. It means a very large expenditure of time. Now, as regards the physician who attends the poor in the hospital or dispensary, he spends a good part of his forenoon in visiting in the medical wards of the hospitals. And that is being done in Boston right along by physicians and sur-

geons who spend, not ten minutes now and then, but an entire forenoon during three or four months of the year.

In any community it would be a little hard for one dentist to give all the time necessary for the care of the teeth of all the poor children. I suppose most of the children are poor. We think here in Boston all the sick people are poor. But if a number of dentists gave each a little time, large numbers of poor children could receive appropriate attention.

Dr. Smith.—I would not in my remarks be understood to underestimate the value of the gratuitous services of the physicians or the surgeons, but if we are to praise the gratuitous work of the physicians and surgeons in Boston, or any large city, we should, with justice, speak of the gratuitous work on the part of the dentists. We have dentists who are giving a great deal of their productive time to the dental infirmaries. We have demonstrators in the Harvard School who give the entire forenoon every day in the week. We have Dr. Eddy here from Providence, who gives an entire day once a week, which is practically a free service; the salary which he receives amounts to almost nothing.

It is also true, I think, that the young dentist becomes a busier man in his practice earlier than the young physician or the young surgeon, and therefore the young physician and the young surgeon can afford to give their time better than the young dentist. And then again, the young surgeon needs his hospital experience, and on that account is always very glad of the opportunity to give all the service he can.

Dr. Brackett.—There is this difference between the practice of the dentist and the practice of the physician: the physician visits the patient, investigates the case, and directs what shall be done. The dentist sees the patient, and has to go to work and do with his own hands what has to be accomplished. There is no nurse or relative or attendant who can carry out the dentist's directions. He must take his own time, and he must do with his own hands that which is to be done. There are instances, of course, where the physician performs the functions of the nurse, but, as a rule, there is this difference between the two practices: the physician is a man who directs what others shall accomplish; the dentist has to go about the labor himself.

President Pond.—There is another point, and that is the amount of work. I hardly think any physician will claim there

are ninety-seven per cent. of the children needing his services. There are ninety-seven per cent. of the children needing our services. With such an immense amount of work to be done, and so few to divide it among, you will have to have some different scheme from anything that has yet been proposed, it seems to me.

Is there anything further?

Dr. Clapp.—I should like to move a vote of thanks to the gentlemen who have so kindly favored us this evening, and given so much instruction.

Voted.

On motion, adjourned.

CHARLES H. TAFT,
Editor American Academy of Dental Science.

Editorial.

THE "DENTAL DIGEST" AND THE "FACULTIES."

THE July number of the *Dental Digest* contains an editorial on "The Duty of the Faculties Association." This is by no means a novel subject, for the readers of this journal can safely and surely look forward to an editorial at this season of the year scarifying the Association of Dental Faculties and dental colleges in general. The editor of the *Digest* would, seemingly, approach the fall months in an unhappy frame of mind if this duty had been neglected.

While this earnest persistence in a course supposed to be right is to be commended, there are some connected with college work who fail to understand the motive force that continually drives the editor of the *Digest* into desperation during the high-temperature days. It is understood that the editor is never quite happy unless he has something to say against dental colleges. Having, however, apparently exhausted his mental efforts in this direction, he repeats his editorial of June last year in this July number, adding a few words by way of refreshment to his readers.

The motive which brought forth this editorial was found in the address of the President before the Illinois State Dental Society

and the discussion which followed. The main topic of this address was, of course, dental education. Whenever everything else fails this is an ever inexhaustible topic. The remarks upon this paper, if reported correctly, do not reflect much credit upon the participants. One arrives at this conclusion: "If the Association [Dental Faculties Association] sees fit to continue whitewashing incompetent colleges, as it has done in the past, and to receive as members schools which are verging on the disreputable, then the sooner it disbands the better it will be for dental education." Again, he says, "I am not willing to remain quiet longer and be classed as a member of the Faculties Association when it admits and retains some of the schools that are in it to-day."

The distinct charge here made, if true, should be met by the Association, and it is to be hoped that before this reaches our readers this will have been done. That there are weak schools connected with the Faculties may be true. If so, the fault lies not with the Association, but with the boards of examiners of the several States primarily, and with the committees, of which there are two, one preliminary and one final, appointed to examine each school before it can be considered. It is assumed, without any fear of successful contradiction, that no body of men have more carefully lived up to their rules in this respect. While this is true it is equally certain that in this, as in all associations, all churches, all governments, are to be found persons ready to thwart the best efforts of those in control. The college without a degenerate would be an anomaly. A profession without an empirical impostor would be an organization that has never yet existed. The gentleman who made the remarks quoted, while nominally a member of the Faculties, through his college, has never taken any active part in its proceedings, and hence is quite incompetent to form an opinion.

The writer, early in the history of this body, was made chairman of a standing committee to receive complaints made against colleges violating rules. It was originally named the Ad Interim Committee, as it was supposed to be actively at work during the period between the sessions. For years the writer served without fear or favor in this capacity, and during that time there was never any "whitewashing" done, not even of the highest dental colleges in the land, as some found to their cost. While the attempts made to violate rules were frequent, they were invariably met and the parties disciplined, but of this the outside dental world knew

nothing, and hence inferred that the Faculties accepted members without proper examination, and then permitted them to go on in their own way regardless of rules or professional requirements.

The Association of Faculties since its organization in 1884 has had a serious task given it to perform. Those who were familiar with the dental profession prior to that time can appreciate the results of this labor. The handling of the many questions that have from time to time come before this body required the best judgment and most tactful consideration. The Association has done a great work, and is still doing it, in spite of clamor outside from parties ignorant or woefully blind to the progress made in dental education through its efforts.

The writer is not attempting here an apology for the Association of Faculties. It needs none. With all its imperfections as an organization it has combined the dental educational forces, to the end that a higher standard has been attained in this country than could possibly have been anticipated seventeen years ago, and which could not have been accomplished without its aid.

The editor of the *Digest* settles this whole question for himself when he says, "Not only is the National Association of Dental Faculties rapidly losing caste in this country and abroad, but American dental diplomas are becoming a laughing-stock in Europe." This coming from Chicago and the State of Illinois, that has through its lax laws made American diplomas a byword in Europe, is the most remarkable manifestation of what the slang world denominates gall that it has been the writer's privilege to see in print for some time. No one knows better than the editor of the *Digest* that it was through the efforts of the Foreign Relations Committee of the National Association of Dental Faculties, and the money from its treasury, that these foreign (not American) diploma mills were crushed out and some of the proprietors landed in jail. There is a vast work to be done in starting the so-called school men of Illinois upon the right path, and we would suggest that the editor of the *Digest* turn his great mental activities in that direction, and leave his midsummer stereotyped editorial for a future day and generation that may need it.

To those outside of the Association of Faculties who claim everything in the way of educational progress it may be said that there is a modest path that worthy men prefer to follow, and the writer would recommend them to seek it. In the mean time the

Association of Faculties will go on its way, will not disband, but quietly and surely build up the dental educational structure until its proportions will be such that even the most rabid opponent will be silenced and the ingrained jealousy of the *Digest* will have died a natural death.

Bibliography.

ORAL PATHOLOGY AND PRACTICE. A Text-Book for the Use of Students in Dental Colleges and a Hand-Book for Dental Practitioners. By W. C. Barrett, M.D., D.D.S., M.D.S., LL.D., Professor of the Principles and Practice of Dentistry and Oral Pathology in the University of Buffalo Dental Department; Professor of Dental Anatomy and Pathology in the Chicago College of Dental Surgery, etc. Second Edition. Revised, Enlarged, and Illustrated. The S. S. White Dental Manufacturing Company, Philadelphia, 1901.

The fact that in three years this work of the author, Dr. W. C. Barrett, has exhausted the first edition is sufficient evidence that it has filled a need in dental education.

The first edition was, in the opinion of the reviewer, very defective for several reasons, the main one being that of an entire absence of illustrations. These may be and generally are overdone, but a good cut, representing fully the ideas sought to be conveyed in the text, is an important auxilliary in education. The author acknowledges that he profited in the preparation of the second edition by the criticism made upon the first, and has very fully and, it is thought, judiciously illustrated the present volume.

The number of pages has been increased to three hundred and nineteen, "not a chapter reading as it did originally," the author states in his preface.

An effort seems to have been made to harmonize the author's views with those held by the dental profession, an effort not apparent in the first. This is especially true in regard to dentition, but even here there is still a tendency to what the reviewer would call false reasoning. This is manifest in the following paragraph:

"The condition of the gums should be carefully noted. If they are normal, without any special inflammation or thickening, we should look elsewhere for the source of the irritation."

This would lead any one following this advice into wrong conclusions, for the irritation from dentition very frequently is manifested long before resorption of the bony crypt takes place; indeed, frequently, as the reviewer has demonstrated, several years prior to eruption in the second permanent molar and proportionately so in all the developing teeth. If the practitioner waited for this indication upon the gums, an impacted third molar might send the patient to an insane asylum or an early grave before he would be able to diagnose the origin of the disturbance; but the author, apparently, does not regard permanent dentition of any importance, for it is not mentioned.

The author, when he does lance, regards the "crucial incision" as the best. A cut of this character is more difficult to make and is not as effective in releasing the cusps as that made in the form of the letter X.

The reviewer must agree with the author when, in discussing capping of the pulps, he writes, "When the pathological condition shall have proceeded to the extravasation into the body of the tissue of inflammatory products, there are practically no lymphatics to take them up, and their removal is as impossible as is that of any great effusion in the brain. Pulp-capping under such circumstances will be a hopeless proceeding, and the presence of any infiltrated or effused matter will contraindicate it." The pulp when free from inflammatory products is, in the opinion of the reviewer, a possible subject for capping.

The author's arrangement of the diseases of the pulp are far from satisfactory; indeed, he indulges in generalizations to an extent that must be confusing to the student. The reviewer would recommend to the author a perusal, if not adoption, of Arkövy on the various lesions of the pulp. He occupies one extreme, and our author the other. The reader will look in vain for any description of superficial pulpitis, a pathological condition long since recognized by writers in Europe as well as by some in this country.

The treatment of pericementitis as given is, in many respects, unphilosophical and almost borders on empiricism. Such, for instance, is the advice "to seal up in it [the pulp-canal] some of the essential oils." To seal up means the retention of all the gases

of decomposition, necessarily forcing the septic matter through the foramen, increasing the inflammation of the pericementum. Again, "Lumps of ice wrapped in muslin may be placed between the lip and the tooth." Will the author kindly explain the effect of cold upon the peripheral blood-vessels in his next edition? Will these not be contracted and the contained blood be forced to the focus of inflammation, thus increasing the hyperæmia of the part? The student following the author's advice would certainly have quickly an abscess to deal with.

The rather dogmatic assertion that "the so-called 'green stain' of childhood is wholly superficial and has no pathological significance" needs qualification. Those who accept Williams's dictum, endorsed by Black, that the gelatinous plaques upon teeth are a cause of decay, can hardly be consistent and refuse to believe that the organisms of green stain possess the same quality. It is true that the special organism producing this has not been isolated, but the clinical fact remains that the enamel of all teeth so affected, even in later life, are more or less eroded, and in children the destruction is often serious. It is the opinion of some investigators that this destruction precedes the coloration. This has yet to be proved.

The reviewer never approaches the question of treatment of pyorrhœa alveolaris by writers in general, that he is not struck with the therapeutic limitations of the dental profession, and the author furnishes no exception to the rule. As far as he goes, the removal of "serumal tartar," the treatment of the pockets by acids, and the use of a "weak solution of chloride of zinc" as a stimulating astringent constitute the principal treatment. This, as a whole, is to the reviewer unscientific, as it is not based on the conditions present. Whatever discordant notes may be heard upon the etiology of this disease, there should be but one opinion,—that, properly managed, it can be cured, the exception being that which the reviewer designates as senile pyorrhœa; and this he holds to be practically incurable, for reasons that space will not permit him to give. The fact that similar conditions may cause a recurrence of this disease is admitted, but the physician who has given a clean bill of health to a patient recovering from typhoid fever would not say to him, You are immune from further attacks. The constant statement that pyorrhœa alveolaris is not cured because it returns, is an absurd position to take.

Chapter XLVII. is curious in that it seems to contravene all known conceptions of what constitutes secondary dentine, pulp nodules, and calcifications. The author starts out with this remarkable sentence: "These, although different manifestations, are parts of the same process. . . . All of these products have the general structure of dentine, although it may be considerably modified." Space or time is not afforded to enter upon an examination of this statement, but, as the reviewer understands it, this is entirely at variance with recognized histological facts, and, therefore, it was incumbent upon the author to give some reason for his opinion other than the single illustration which, while it bears out his conclusion, is evidently a true picture of secondary dentine, and not that of a pulp-stone as generally understood.

The chapter on syphilis is well prepared and equally well illustrated. It is, perhaps, one of the most satisfactory in the book.

The author is hardly excusable in omitting, in his otherwise valuable chapter on neuralgias, or in that on dentition, some allusion to the lesions resulting from impacted teeth. An entire chapter might profitably have been devoted to the reflexes resulting from these malpositions.

The consideration of the book cannot be extended farther. There is much that is valuable in it, but much that should have been corrected or entirely eliminated. The reviewer is aware of the fact that the preparation of a book on dental pathology involves greater difficulty, and is more likely to arouse adverse criticism, than any other subject connected with dental practice. It is the youngest of the specialties, and, as a result, methods of practice are not well established. While this is true, certain fixed principles of general pathology are understood and should be made to govern special practice.

The book is given with the usual care to detail of the S. S. White Dental Manufacturing Company.

Obituary.

RESOLUTIONS OF RESPECT TO DR. THEODORE EMANUEL LE CAUDEY.

WHEREAS, We, the members of the American Dental Society of Europe, have heard with deep regret of the death of our distinguished colleague, Dr. Theodore Emanuel Le Caudey; therefore

Resolved, That by this sad event our profession has lost one of its most revered members, whose fame belonged not only to his own country, but which was also the prized possession of the civilized world.

Resolved, That we offer to his afflicted family the assurances of our respectful sympathy.

W. E. ROYCE.

N. S. JENKINS.

W. R. PATTON.

DR. NELSON W. WILLIAMS.

DR. NELSON W. WILLIAMS was born at West Liberty, Logan County, Ohio, October 23, 1834, and died at Nice, France, May 5, 1901.

Dr. Nelson commenced the study of dentistry with Dr. Harris, of West Liberty, Ohio, about 1855. During the succeeding five years he diligently prepared himself to enter the Ohio College of Dental Surgery, which he did in 1860. After taking one course he started practice at West Liberty, dividing his time between that place and Kenton, Ohio. After two years of practice he returned to college, when he graduated in 1863. Shortly after this he entered into partnership with Drs. Jonathan Taft and George Watt, of Xenia, Ohio.

In 1871 he was invited to enter the practice of Dr. Slayton, Sr., of Florence, Italy. This he accepted, going there in 1872, but after a year's stay in Florence he decided to go to Geneva, Switzerland, where he bought out the practice of Dr. George W.

Field, now of London. After several years of hard work his health failed, and he had to go to the Riviera to recuperate. Finding he could not endure the rigors of the Swiss winters, he decided to dispose of his Geneva practice and locate at Nice, where he practised until his death.

He was a member of the Ohio State Dental Society and of the Mad River Dental Society, from both of which he received a specially gratifying testimonial upon his leaving Ohio for Europe. While at Geneva he was one of the five founders of the American Dental Society of Europe, and while failing health of late years had prevented his regular attendance at its meetings, he always had a warm place in his heart for its welfare and success, as was testified by his cheery letter read at its last meeting at Cologne. As a matter of history it may be interesting to note that Drs. Watt and Williams were the first to make crystal gold in the United States, and Dr. Williams was the one to introduce it to the profession in Europe, and he also showed his lamented friend, Dr. de Trey, of Vevey, how to produce it, the outcome of which is the solila gold of to-day.

Dr. Williams was the pioneer of American dentistry on the Riviera, and those who had a close acquaintance with him will sadly miss his kindly genial greeting, and will join with the wife and daughters who now mourn the loss of husband and father in bowing to the stern fate that deprives them of a dear good friend and our profession of one of its pioneers and most skilful and conscientious representatives.

He was laid to rest in the French Cemetery at Cancade, near Nice, in the presence of a great concourse of sorrowing friends and all the members of the French Dental Society of the Riviera. *Requiescat in pace.*

RESOLUTIONS OF RESPECT TO DR. THEODORE F. CHUPEIN.

WHEREAS, With regret we note the death of Dr. Theodore F. Chupein, an honorary member of the Academy, who departed this life March 23, 1901; and

WHEREAS, Dr. Chupein has ever been an active and progressive member of the dental profession, thoroughly devoted to its interests,

and who by his earnestness, his interest in society work, and his ability as a writer, as evidenced by his many contributions to dental literature, did well merit the honorary membership conferred upon him when the Academy was organized; therefore

Resolved, As the sense of this society, that by the death of Dr. Chupein the Academy has lost a distinguished member and the profession a faithful follower. That as a man Dr. Chupein was affable, kindly, and unselfish, and as a practitioner skilful, conscientious, and enthusiastic in all that tended to professional advancement.

Resolved, That these resolutions be recorded upon our minutes and published with the proceedings of the Academy.

(Signed) WM. H. TRUEMAN.
S. H. GUILFORD.
C. N. PEIRCE.

DR. HORATIO GATES HALL.

AT his residence, in Piqua, Ohio, Dr. Horatio Gates Hall died, May 23, 1901, of Bright's disease, aged seventy-one years.

Dr. Hall was one of the best known dentists in Western Ohio. He had been actively engaged in the practice of dentistry for forty-six years. He was an honorable, genial, and Christian gentleman, and one whose acquaintance and friendship was well worth seeking. He leaves a wife, two daughters, and two sons, and is the first of four brothers, all dentists, to be claimed by death. He will be greatly missed.

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No. 9.

Original Communications.¹

THE TREATMENT OF CERTAIN ORAL EXPRESSIONS
COMMONLY DESIGNATED PYORRHŒA ALVEO-
LARIS.²

BY GEORGE F. EAMES, M.D., BOSTON, MASS.

MR. PRESIDENT AND MEMBERS OF THE NEW YORK INSTITUTE OF STOMATOLOGY,—The honor implied in your kind invitation to speak to you is deeply appreciated; were this not so, your present speaker would not be in his now precarious position. He finds much relief, however, in the fact that the call of the committee is for remarks on treatment only,—for the simple story of the treatment of various cases in his own office; but it would seem, if a suggestion may be allowed, to be of the greatest practical usefulness if your committee would bring to a meeting of the Institute three or more patients illustrating as many varieties of pyorrhœa, and have every member see the patients for himself.

These cases should be well marked,—not hopeless,—and referred to some member for treatment, and when this is finished, or carried to a certain point, a detailed report may then be given

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology, May 8, 1901.

to the Institute, the patient again presenting for inspection by the members.

In no other way can you all have the same mental picture of the condition under discussion; therefore in no other way can you talk intelligently about it.

These remarks are not advanced as an elaborate and scholarly essay; the author has no pet theories to announce, makes no pretence to superior skill, has no peculiar or essentially new line of treatment to advocate, but he does urge a more systematic, thorough, and painstaking practice of well-known and established principles of treatment, and he presents a few original suggestions as to the methods by which these principles may be applied.

Prophylaxis is all-important; indeed, in many cases it is absolutely essential to the salvation of the teeth; the term is a broad one, and should include every known means, and every possible effort to prevent disease.

You are familiar with the suggestions of Dr. D. D. Smith, of Philadelphia, as to prophylaxis; the writer is in hearty accord with all that he is doing in this direction, and carries out the treatment as suggested by him, modifying or adding to it as the cases seem to demand.

Dr. Smith argues that there is an increased deposition of tooth-material consequent upon the stimulation or irritation produced by rubbing the surfaces of the teeth with stick and pumice. Obviously, on first thought it would seem well to select only those cases for this treatment in which the teeth need the tissue-building process, and not those which have already been over-stimulated from other causes, such as abrasion, erosion, and calcareous deposits. But these cases necessitate not only the removal of all deposits, but the polishing process as well, and it seems fair to presume that this necessary treatment does not cause increased hypercementosis, or intradentinal deposit, but that the gentle massage applied to the surfaces of the teeth may, after the removal of irritating causes, bring about a cessation of dentinal or cemental development, and an absorption of any soft tissue overgrowth which may exist.

My usual method of procedure in all cases is, first, to spray the mouth with a warm antiseptic solution, using compressed air; this quickly removes any infectious material and enables one to make a better examination.

In all the varieties of this disease, however slight or however great the amount of deposit, this and all other foreign material acting as an irritant are thoroughly removed.

If there is a considerable amount of deposit, and the gums are especially sensitive, an attempt is made to remove a portion of it at the first sitting, as it seems idle to expect any material reduction of the inflammation until this is done.

At the next sitting, the swelling and tenderness being usually reduced, a thorough removal of the deposit may be made.

As a local anæsthetic a five per cent. solution of the oleate of cocaine has failed in my hands to accomplish the desired result. A four per cent. aqueous solution, however, is effective, and the chloroformic mixture suggested by Dr. Cravens gives still better results. A napkin, or its equivalent, is placed so as to protect the parts and check the salivary flow, the pocket is made dry, and the cocaine is either injected or applied by means of floss-silk, or small ropes of cotton placed at the bottom of the pocket and allowed to remain from three to five minutes, while some other part is being treated.

For the removal of the deposit I have devised certain forms of instruments which I will pass around. Very few of those on the market are available for my use. The deposit and all other diseased tissues being removed, the root, in suitable cases, is polished with the orange-wood stick and pumice.

During the operation of removing the deposit the instrument is dipped in a bath containing carbolic acid or other antiseptic solution every time it is removed from the mouth, and the pockets are frequently washed with some antiseptic solution, usually hydrogen peroxide. This is the syringe and the point used for this purpose.

Regarding methods of removing the deposit, no one can tell another exactly how he should operate, or what shape of instrument he should use, to get the best results. I believe that each practitioner will achieve his greatest success by following the method and using the particular instrument which he finds adapted to his own individuality, but this will not prevent him from receiving much benefit from suggestions both as to methods and as to instruments, and it is in this spirit that these little knick-knacks are offered for your consideration. The shapes of these instruments, it seems to me, will suggest at once to you the various

uses to which they may be put, therefore a description of their use will not be necessary.

When the pockets have been thoroughly cleansed and the accessible portion of the root polished, a mouth-bath is given. I will pass around the instruments which I use for this purpose; they are connected with the hot and cold water faucets by the ordinary tubing, with the exception of a relief cock for the purpose of testing the temperature of the water and for turning it on and off from the mouth. The water is made as hot as can well be borne in the mouth, and the flushing process is maintained for about three minutes. Following the mouth-bath the antiseptic paste is injected into the pockets by means of the syringe, which I will pass around. The needle is gently pushed to the bottom of the pocket and the screw turned; the plastic material is forced out until it appears at the margin of the gum. A hypodermic needle attached to this syringe may be carried through the gum to inaccessible pockets when necessary. The instruments for the removal of the deposit, the syringe and points for injecting plastics into the pockets and also between the teeth for the prevention of decay, and the mouth-douches are presented to The New York Institute of Stomatology for what they are worth.

The object of the plastic preparation is obvious. It is of such a degree of plasticity that in those large pockets which do not perfectly fill with blood-clots it keeps the pocket free from infection, is soothing to the tissues, and remains for a long time. In shallow pockets and spaces between the teeth I have found that this plastic material can be placed very effectively with the ball of the finger. The prescription for this preparation is as follows: Vaseline, one ounce; white wax, a half-ounce; hydronaphthol or aristol, fifteen grains; menthol, three grains.

The next step in the treatment is the application of a remedy recommended by your worthy ex-president, Dr. E. A. Bogue. It is prepared by dissolving zinc sulphate to saturation in cold water; put one ounce of potassium iodide in two ounces of water, adding as much iodine in crystals as it will take up; then take equal parts of the two solutions and put them together. This solution has many excellent properties, and I often use it at the beginning of treatment, instead of cocaine.

Whatever the part played by bacteria, the treatment is intended to combat their growth as well as their effects.

Massage has long been recognized as an effective means of bringing about an absorption of overgrown tissue, and in those spongy and enlarged conditions of the gum-tissue may be employed, I think, to advantage. The patient is directed to smear the ends of two or three fingers with vaseline one ounce and menthol two grains, and rub the gums surrounding all the teeth for five minutes, twice daily.

In addition to the ordinary bristle tooth-brush, of the best shape at command, I have adapted a brush with rubber bristles for the purpose of brushing the teeth, and especially the gums. The rubber brush appeals to me as having a better effect on the soft tissues, and it is my belief that the patient is more likely to use it on the gums than the brush with hair bristles.

The importance of correcting malocclusion, of supporting loose teeth by fixation, and of inserting bridges between progressively inclining teeth, need hardly be emphasized before this society.

The replantation of teeth around which the disease has progressed to a great extent offers its temptations. It savors of clean surgical work, and there is a good prospect of bettering the condition of the tooth, but we have no assurance of permanency. Replantation is usually delayed until the disease is advanced beyond a hopeful prognosis, it is true, but under much better conditions the majority of teeth are lost at the end of twelve or fifteen years. In other words, when a tooth is so slightly affected by this disease as to offer good hopes in replantation, we may well consider it a promising case under the ordinary treatment *in situ*.

Replantation has its place, however, for in advanced cases the usefulness of a tooth may often be prolonged by replantation and fixation to another tooth. Mouth-breathing undoubtedly has always a deleterious influence, and especially in pyorrhœal cases; the remedy for this trouble should be applied. Teeth having devitalized pulps should certainly receive treatment.

The thorough sanitation of the oral cavity brought about in the treatment of pyorrhœa alveolaris has more than a local effect, for the swallowing of infectious material can do nothing but undermine the general health, and this in turn reacts locally in the mouth. We are thus imperceptibly led to consider the relation of constitutional conditions to local ones as manifested in the mouth.

It is fair to assume that many persons have lived the allotted time of life with an inherited predisposition to tuberculosis simply

because a wisely selected mode of living was sufficient to prevent a local outbreak. Likewise, it is also fair to assume that an inherited or an acquired predisposition, with a tendency to a local expression in the mouth in some forms of so-called pyorrhœa, may be kept from doing serious damage to the oral tissues by thorough local and constitutional treatment, and it pays to do this even though it be at the price of "eternal vigilance."

We may institute such thorough local treatment, thus removing all the weak or susceptible points, that the constitutional factor cannot show itself in any of the oral tissues; but the most thorough and scientific constitutional treatment cannot effect a cure while there are filth pockets existing in the mouth. Therefore, a cessation of symptoms is possible by means of intelligent local treatment, but not possible by the most thorough constitutional treatment if local treatment is neglected. In all cases which do not yield to local treatment an examination of the saliva, blood, and urine is made, supplementing, of course, a general examination of the body.

In acute cases to which the term phagedenic pericementitis is applied, and in which there is severe pain, with swelling and looseness of the tooth, I have invariably found rheumatic symptoms. In these cases only the mildest local treatment is applied, consisting of antiseptic injections and washes, and pronounced general treatment calculated to raise the alkalinity of the blood, and to eliminate effete products.

There are many other cases presenting with pain and tenderness in the region of the roots of the teeth for which no local cause can be assigned. Such cases have always responded to constitutional treatment. In all these cases there have been swollen joints, neuralgia, and other symptoms of uric acid poisoning. In speaking of uric acid I do not mean to convey the impression that uric acid always acts as a poison, for, indeed, it exists in the blood normally in a small quantity. A brief allusion to the patient who has come before you may best illustrate this point.

This patient presented about a month ago with turbid and swollen gums containing pus, undoubtedly due to the large light or yellow-colored salivary deposit. He complained of a very disagreeable taste in the mouth; otherwise, he claimed to be in perfect health; no constitutional derangement could be detected from a most careful physical examination.

Having so far as possible eliminated the local causes, with the result of improving the condition of the gums and checking the flow of pus, but not the deposition of lime-salts about the teeth, an analysis of the saliva, urine, and blood was made.

The reaction of the saliva was alkaline; specific gravity, 1006. Total alkalinity equalled 0.0351 per cent. Na_2CO_3 .

According to the few tables in existence the normal saliva has an alkalinity of about 0.08 per cent. Na_2CO_3 , with a specific gravity of 1003 to 1006.

The saliva in this case, therefore, contains a large amount of solids and has a low alkalinity.

These facts tend to confirm the supposition indicated by the pathological condition found in this patient's mouth,—viz., that the saliva contained an excessive amount of calcium salts, and though the low alkalinity might serve as a partial cause for the separation of these salts from solution, this cannot be definitely settled until the normal variation of the lime contents of the saliva has been determined.

The supposition may be held, therefore, that there is in this case either an excess of lime or an abnormal condition favoring deposit. The facts seem to suggest an excess of lime-salts rather than an abnormal condition favoring deposit.

The examination of the blood in this case showed it to be practically normal. The urine was of a strongly acid reaction, containing calcic oxalate crystals, giving evidence of a storing up in the body of the normal products of metabolism, especially the xanthine or uric acid group of products. The totals of urea, chlorine, phosphoric acid, and uric acid are all lower than normal.

Treatment will be given to increase the elimination of solids, especially of the uric acid and allied substances; for example, phosphate of soda, fifteen grains t. i. d., and bicarbonate of soda, a salt-spoonful twice daily. The oxaluria gives evidence also, probably, of the same faulty metabolic process, and would yield to the same treatment. The diet should be regulated so as to avoid tomatoes, onions, and an excess of starchy or sweet foods, and the patient should drink three pints of distilled water daily.

THE LITERATURE OF THE PULP.¹

BY VIDA A. LATHAM, M.D., D.D.S., F.R.M.S., CHICAGO, ILL.

IN reviewing the work done on the dental pulp, it appeals very strongly to the operative side. In other words, the majority of the papers concern themselves with the *pathologic* conditions, which include special and general pathologic states from inflammatory to degenerative and bacteriologic gangrene to formation of pulp-stones and the treatment of the same. One noteworthy point is the constant effort directed to the "killing of the pulp" by every known means and the very little encouragement to try to save the "formative organ." In these days of advancement of the histophysiologic research, and of the introduction of new methods and chemicals, it seems strange that the dental pulp appears to have been considered as either completely worked out or not so important an organ as enamel or dentine, or even the peridental membrane. Yet its development, structure, functions, and variations are hardly understood,—and we expect to cure its ailments! It is true a great deal has been investigated and many essays and papers presented from all parts of the world, but very little truly scientific work has been completed.

In this paper, so far as possible, references to the operative treatment of the pulp have been excluded, and in considering the anatomy, histology, and especially the development of the pulp many authors have described the neighboring structures of odontoblasts, dentine, and enamel, it being impossible to separate them wholly from the pulp. Any one wishing to study the latter must be willing to examine also the former.

Dentists are now waking to the fact that we must have more preliminary training in the elementary branches, and schools of dentistry are constantly improving. It would be a worthy object to found grants, scholarships, and opportunities for original research work to post-graduates or advanced workers, instead of such memorials as oil-paintings, busts, etc. The former would carry far more weight, would perpetuate memory in a nobler way, and reach to almost every clime and class by constant quotation,

¹ Abstract of a paper read before the American Medical Association, Section on Stomatology, at St. Paul, Minn., June, 1901.

thus enriching science and benefiting thousands of suffering humanity. How many libraries contain works on dentistry accessible to the student that are of recent date or valuable in looking up the subject? It has been said that publishers object to giving the large medical and scientific libraries a copy of a book for fear of lessening its sale. Personally, I think this objection should not be sustained, as many people who note a new book in a library or store, finding it suited to their needs, will buy a copy to have at hand. Owing to the scarcity of accessible works, even in the majority of our large central cities, the task of "looking up literature" is by no means easy or worthily done, oftentimes many essays and papers scattered through the numerous journals being out of reach. Better libraries are needed.

Perhaps the earliest mention of the dental pulp is by Galen,¹ who states: "He felt the pulsation in a tooth that was aching in the same way as any other inflamed part. I know that the seat of one pain was in the tooth and the other in the gum." To Galen we may also ascribe the discovery of soft nerves supplied to the teeth.

In 1771 John Hunter noted the building up and closing in of the pulp-cavity when attrition has worn the teeth, as did George Prochaska (1780) in his work published in 1800. Besides these, we may note Thomas Bell, Bertin Rousseau, Lent, Raschkow, R. Owen, Alexander Nasmyth, Kölliker, R. T. Hulme, E. Albrecht, R. Hohe, J. Bruck June, F. Ulrich, and many others whose papers chiefly relate to calcifications in the pulp and pathology.

About the earliest histologic point I have found so far seems to be by Paul B. Goddard,² who described the pulp as composed of granular matter invested by a delicate membrane or epithelium.

Professor L. S. Beale in 1865 states the pulp-tissue is not converted into dentine, neither does the dentine nor the tissue from "which it is formed exhibit any characters justifying in stating it to be connective in origin. Dentine is only produced by the agency of the so-called cells." The mass of the pulp is composed of a single form of connective tissue with numerous oval and triangular corpuscles (germinal matter), not unlike the mucous tissue of the umbilical cord. (This will seem to be foreign to the title of this paper, but I find in almost all articles the close relation of dentine and its histology and origin the chief topic.)

Kölliker³ summarized the dental tissues in one of the first text-books which held its place for many years. The odontoblasts were formally termed "dental cells" (Elfenbeinzellen). Kölliker termed this entire layer of cells *Membrana eboris*, because after the pulp has been withdrawn it usually cleaves to the inner surface of the tooth in the form of a continuous membrane-like layer. Kölliker, Klein, and others state that odontoblasts excrete dentine, differing from Waldeyer, who has a most complete and satisfactory theory as regards the development of the teeth. He also makes mention of Sharpey's fibres being formed in the cementum, and agrees with Boll that the odontoblasts (a term originating with Waldeyer) send fibres and connect with each other by lateral processes. He also edits the article on "Formation of Dentine,"⁴ which formed the basis of a controversy with Professor H. Hertz in Virchow's Archives, and was used by Franz Boll in order to explain the contradictions of the two investigators and so form an independent opinion.

Franz Boll is an investigator to whom we owe much. His work⁵ is standard to-day, even in the light of so much new research by better methods and apparatus. Professor Waldeyer, of the University of Breslau, eminent as an histologist and microscopist, says in his famous essay on "The Mouth and Development of the Teeth," "We owe to Mr. Boll (a medical student at Bonn, where his essay was written) the first definite knowledge of the condition of the nerve-fibres in the teeth." Boll says we *never* secure the whole pulp or *all* the soft part of it, as the odontoblastic processes project into the tubes of the dentine. Let one be ever so careful in extracting the pulp from freshly cracked teeth, a trace of this peculiar layer will rarely be found on the surface of the pulp. But if cracked and then hardened in chromic acid solution for an hour, using considerable care in removing broken dentine and a sharp knife, one may sometimes obtain the superficial layer of the pulp *in continuo*. The peripheral processes which are enclosed in the dental tubes generally break close to the body of the cell, but by a skilful movement of the knife they may sometimes be successfully extracted of considerable length from the tubules.

J. Tomes described nerve-fibrils in the dentine continuous with the pulp net-work, and considered these fibrils to be the cause of sensitive dentine. Boll in his demonstrations used the long in-

cisors of rodents, as guinea-pigs, rabbits, etc., which may make some difference as regards the attachment of the pulp to the dentine.

Goodsir's work ⁶ was received without question by most anatomists, if not by all, inasmuch as it gave a very definite intelligible description of observations in place of vague general notions, especially as regards the development of enamel, which was, in 1863, clearly demonstrated by Professor Kölliker.

Legros and Magitot, in their work,⁷ give a very excellent *résumé* of much value. This work, published in 1873, was translated in 1880 by M. S. Dean, of Chicago.

J. Raschkow ⁸ mentioned that the teeth developed under the mucous membrane and enamel-organ. He described the blood-supply of the pulp by two or three arteries, and asserted that the pulp has one large and a few smaller nerves, the latter breaking up near the surface into an exceedingly fine plexus called the Plexus of Raschkow. Boll and others suggest that fine filaments are given off from this plexus which inosculate with the branches of the odontoblast cells, but as yet this connection has not been demonstrated and accepted as a fact.

Neumann,⁹ in 1863, demonstrated the dentinal sheaths, Boll following out the dental nerves in their further course more recently.

Tomes ¹⁰ has most carefully and successfully continued the study of the finer points of dental structure, and, by first demonstrating the dentinal fibres, opened the way to a correct interpretation of the nature of dentine.

Lent ¹¹ demonstrated the dentinal processes of odontoblasts.

Klein ¹² says the cells beneath the odontoblasts are spherical and nucleated, and according to his view the dentinal process is derived from these cells, not from odontoblasts.

Retzius ¹³ observes, by the use of Golgi's stain, that the nerve-fibrils of the pulp appear to penetrate between the odontoblasts and terminate between them and the dentine.

Röse ¹⁴ says with increasing age the odontoblasts appear to suffer atrophic changes.

Erwin Höhl ¹⁵ states that three kinds of cells occur in the pulp at different life periods:

- (1) The outermost peripheral layer of branched cells.
- (2) Centralward the conjugation cell layer, containing the ele-

mentary or primary odontoblasts, the largest process of the cell becoming the future dentinal fibril.

(3) Secondary odontoblasts (dentinoblasts) by conjunction of the first and second layers.

R. R. Andrews¹⁶ states that odontoblasts in forming the matrix of dentine give out minute globular bodies which form a layer of calcoglobulin, not being themselves any part of the matrix. The fibres within the tubes are formed from a separate cell, deeper in the pulp-tissue, whose processes pass in through the protoplasmic mass of the odontoblasts to reach the dentinal tubes of the formed dentine.

BLOOD-SUPPLY OF THE PULP. .

Bödecker,¹⁷ in discussing Mr. Witzel's work, says, "I have not been able to see an artery in a pulp as illustrated, though I will not say there may not be one." So far he has only met with capillaries. Arteries go into the pulp and divide at once upon entering it. In foetal pulps a number of arteries are seen extending to the base of the tooth, but on entering are only seen as capillaries.

Dr. W. H. Atkinson¹⁸ says no embryologist will state that there are three coats on the vessels in the pulp; the large vessels are sinuses.

Dr. A. O. Hunt¹⁹ notes Dr. Patrick's demonstration of the methods of blood-supply to the follicle of the developing tooth. Specimens were prepared as follows: Injections of gelatin carmine were made through the carotid artery; sections cut from the jaw were put into absolute alcohol and ground down, no water being used, only alcohol to keep them wet. Examination of these specimens showed that the blood-supply of the tooth did not pass directly from the artery through the foramen, but was distributed through the cancellous bone by a number of small branches and all along the peridental membrane by a system of capillaries. He believed the nerves did not pass directly through the foramen, but by a circuitous route accompanying the blood-current. All the blood-vessels stopped on the outside of the membrane, and the supply was there taken up and distributed by a system of capillaries. A foetal (eight months) tooth showed this clearly, and he thought it true of the developed specimen. He doubted the old theory that the artery and nerve-fibre entered the foramen directly, and he also thought the office of the peridental membrane was simply to sustain what it had built up. In other words, the artery

breaks into capillaries, passes into the cancellous bone about the teeth, is distributed to the peridental membrane, and from it to the pulp through the apical foramen or a number of foramina in the root.

Black,²⁰ in discussing the above paper, agreed with Dr. Hunt in the statement that no direct branch from the dentinal artery enters the apical foramen and supplies the pulp, as depicted in so many text-books, but that many arteries, branches from the main dentinal arteries, are distributed to the bone of the alveolus and the peridental membrane, forming a net-work which gives off branches that enter the dental foramen and supply the pulp. "In children you will find a half-dozen, and before the root is fully formed you will find hundreds of them entering the pulp from all directions, but as the foramen decreases in size they are shut off until there is but one."

J. Leon Williams²¹ describes the blood-supply of the pulp as coming from two sources,—viz., the pericementum and the medullary canal,—and has observed in recently developed teeth small blood-vessels passing from the pericementum through the side of the root into the pulp; also, in the odontoblast layer of cells, he notes an "intricate plexus of very fine blood-vessels in the odontoblastic layer of cells."

H. H. Burchard²² believes (though he has not demonstrated) that the pulp has an extensive collateral circulation, the branches of the inferior dental arteries anastomosing freely with the branches of the external maxillary, facial, coronary, mental, submental, sub-lingual, gingival, internal maxillary and its branches, other than the inferior dental.

Cryer's dissections showed that in the lower jaw the inferior dental artery is the main supply.

In the embryo, as early as three months, a blood-supply in the dentinal papilla is evident, vessels showing in the dentinal papilla (the future pulp) before the follicular walls (in part the future pericementum) is outlined. "When the dental tissues proper begin to form, the follicles lie in a gutter of bone, their bases (the future necks of the teeth) separated from the bone by a comparatively thin layer of fibro-vascular tissue in which lie the inferior dental vessels. At this stage numerous arterial trunks are seen passing into the immature pulp." At seven months the lateral blood-supply (from the periosteum) is more marked than that

from the base of the dentinal papilla and quite distinct from the vascular supply to the pulp. Bone forms around all the arterial trunks, enclosing them, the vessels being at first enclosed by indifferent tissue, this becoming fibrous and, finally, ossification taking place.

Hertwig's "Embryology" describes the visceral arches at an early stage in the development of the ovum, and states that differentiation of the tissues of the visceral arches into bone, muscle, fascia, and glands changes the anatomical relations of the arteries originally supplying the arches.

Burchard's conclusion is that the pericementum is supplied from arteries which enter the apical space in several branches from the dental arterial trunks and that there is free anastomosis with the vessels of the alveolar walls. The pulp is supplied by several trunks from the dental arteries. In case of obliteration of these trunks collateral circulation is established through the vessels of the pericementum and alveolar walls.

Retzius investigated the *endings of the pulp-nerves in fishes, reptiles, amphibians, and mammals*. He used the Golgi method and traced the nerve-fibres to their terminal fibrillæ, which appeared under the dentine or on the free surface of the pulp, occasionally, in the teeth of young mice, running between the odontoblasts and the dentine, but never in the dentinal tubules.

Huber²³ studied the *nerve-supply of the tooth-pulp in dogs, cats, and rabbits*, employing the *intra-vitam* methylene-blue method of staining. He demonstrated that the medullated nerve-fibres going to the pulp in large bundles break up into small bundles which anastomose and form a plexus in the fibrous tissue membrane covering the under surface of the pulp. From this plexus smaller bundles of medullated nerves pass perpendicularly into the pulp, and can be traced "to all levels of the pulp, some of them to the very tip." Besides these, many medullated fibres leave the bundles and approach the surface of the pulp near the lower surface of the odontoblastic layer, losing their sheaths or breaking up into branches which are non-medulated with varicosities and nuclei, and which branch and interlace with each other, forming a network under the odontoblasts. Terminal fibres given off from this net-work pass up between the odontoblasts and terminate in fine granules near the free ends of the odontoblasts. Somewhat rarely the fibres may be found crossing over the odontoblasts and ending

between the odontoblasts and the dentine. In these findings Huber coincides with Retzius, and he states positively that he found no nerve-fibre in the dentine and no fibre connected directly with the odontoblasts or with any other cell-elements of the pulp. "The terminal fibrillæ or fine branches given off from them terminate in free endings between the odontoblasts or between these cells and the dentine, and are not in connection with the dentinal fibrils directly or through the odontoblasts."

Morgenstern ²⁴ endeavors to establish principally certain special points:

- (1) Innervation of the blood-vessels.
- (2) Relation of the axis cylinder to various cellular components.
- (3) The nerve-endings.
- (4) Structure of the nerve plexus beneath and within the odontoblastic zone.

(1) The innervation is enormous. All the arteries, even the finest arterioles, exhibit an extremely fine and elaborate plexus. In the larger blood-vessels it shows a very regular arrangement of the fibres, one set running parallel with the blood-vessels and another at right angles to them. In this way each nucleus is made to rest, as it were, in a net-work of nerves. One or more axis cylinders are frequently found with the finest capillaries, not uncommonly embracing these in spirals. This was especially easy to prove in the crown pulp of a calf. Morgenstern found similar formations in dentine that had been treated by the corrosive sublimate method (Golgi), and had afterwards been colored with hæmatoxylin. The larger nerve-fibres have Ranvier cells at fairly regular intervals; the finer ones have few cells or none at all, although they have many knobby enlargements, which appear in the finest fibres only as points.

(2) Nerve-endings in the pulp are difficult to determine, as one can never assert with absolute assurance that where a nerve-fibre appears to terminate, it does not really continue in some other direction out of your field of observation. I believe they terminate as free fibres, especially when they divide like a brush into a number of very fine threads. Many axis cylinders end in small knobby enlargements, beyond which for the most part a very fine short thread extends.

(3) Between and below the odontoblasts the nerves frequently

terminate in rounded cellular bodies which could be better shown by another method, by means of which they are brought into sharper contrast with their surroundings. These bodies are identical with the terminal disks described above, we assume. Whether the nerves extend throughout the entire odontoblastic zone—a most important question—could be answered positively by Bethe's modification of the methylene-blue process. In the so-called horns of the pulp, more correctly the crest, the nerve-fibrils are universally present between the elementary cells, which are but imperfectly united to form odontoblasts. These nerve-fibrils lie in close parallel lines and send out a large number of lateral branches between the elementary cells, which are side by side in rows. The fibres show by their marked blue tint, and by the fact that they spring from the primary nerve-fibres, that they are integral constituents of the nervous system which extends throughout the pulp. Dentine germs from human and animal foetal jaws treated by the aniline-blue methods of Ciaglinsky and others (Stroebe) showed the fibrils of Weil's zone to be colored blue, like axis cylinders, but that the dentinogenous substance was likewise colored blue. Where odontoblasts had been formed there were often seen narrow transverse strips of blue tint,* by which the odontoblasts seemed to be divided into segments.

Erwin Höhl also saw this appearance, but correctly explained them as fibrils of the intercellular net-work of nervous elements, and this can be proved by the methylene-blue method and Niki-foroff. Morgenstern's formic acid was peculiarly efficacious. That cells which belong to the nervous system do occur between the odontoblasts is proved by preparations made with methods 2 and 6. The peculiar chemic and optic properties of the odontoblastic zone serve to explain why the morphologic constituents are so difficult to recognize both there and in the membrane *præformativa*. The nearer the odontoblastic zone approaches the dental process the more thoroughly does it seem to be filled with a hyaline substance which opposes an almost insurmountable obstacle to all investigations.

Whether ganglion cells occur in the pulp is perhaps answered by the methylene-blue test to the extent that remarkably large

* *Entwicklungsgeschichte der Zähne in Scheff's Handbuch der Zahnheilkunde, Bd. i. S. 280, 281.*

cells connected with at least two nerve-fibres occur, especially near the larger blood-vessels,—*i.e.*, in the axial portion of the pulp.

SUMMARY.

(1) The nerves of the pulp are divided into central and parietal nerves according to their location. The nerve-branches of the parietal system are more slender, but much more numerous than those of the central. They are spread in two directions, axial and radial, the former following the long axis of the tooth, the latter that of the dentine canals.

(2) Although belonging to the parietal system, its outermost stratum forms a system in itself.

(3) More strongly developed nerve-fibres of the central system form no proper plexus in the pulp; those of the parietal system form temporarily in the young pulps a plexus.

(4) Medullary sheaths of the pulp are secondary formations only determined positively in teeth that have been cut.

(5) Odontoblastic zone is traversed in the most varied directions by nerve-fibres.

(6) Nerve-fibres terminate in several ways: (*a*) Free in the pulp; (*b*) knobby enlargements with projecting supplementary fibre; (*c*) disk bodies frequently seen in the odontoblastic zone.

(7) In the central part of the pulp are some very large cells which may be considered as ganglion cells.

(8) Different varieties of endings occur even in the enamel. These remarkable results of Morgenstern's have been questioned by Röse, who thinks it a precipitate in the dentinal tubules and on the processes of the odontoblasts.

Dr. W. G. Atkinson Robertson ²⁵ says the odontoblasts in the teeth of oxen are bipolar, one process being a dentinal fibre and the other continuous with the nerves of the pulp. He thus regards the odontoblasts and dentinal fibres as becoming in course of development the terminal organs of the nerves of the tooth. These facts and the development of the dentine were made on the teeth of rabbits and kittens, in the former taking advantage of the aid given by feeding the animal for a time on food containing madder, which stains the dentine matrix produced while the madder is being taken, just as it does the matrix of bone. The elongation of the dentine results from proliferation of connective-tissue cells in a formative ring at the base of the tooth-follicle. The thickening

of the dentine results from new layers of matrix added from within under the influence of odontoblasts, not from interstitial growth, which produces nothing more than a slight increase in matrix between the dentinal tubules in the crown of the tooth. To the question whether the nerve passes as a main fibre from the trunk nerve direct through the foramen, or are the nerves in the pulp continuous with the nerves in the pericementum, statements have been made that if the nerves extended through the foramina the broken nerve would be seen extending beyond the end of the root, which is never the case. If any one will take the pains to examine teeth as soon as extracted, examples can often be seen with a projecting pulp or nerve (?) varying from one-sixteenth to one-eighth of an inch in length, sometimes even more. They appear as whitish threads coming from the apex, especially in cuspids, incisors, and bicuspid, bleached on account of the sudden rupture and hemorrhage. Unless noted at the time, the shrinkage is so great it might not be perceived, though carefully fixed material will show the pulp in some cases, specimens of which I have now.

NERVE-SUPPLY OF THE PULP.

J. L. Williams emphasizes the vasomotor nerves of the pulp and pericementum, showing branches (non-medullated) distributed to the blood-vessels. He suggests that stimulation or injury of these nerves may paralyze the vasoconstrictor fibrils a short time before paralysis of the vasodilator fibrils occurs, thus explaining the engorgement of the vessels which strangulates the pulp in arsenical destruction of the latter. The origin of these vasomotor nerves, he states, is "in the upper jaw from the anterior palatine nerve, which, arising from the sphenopalatine ganglion, is connected with the sympathetic system through that branch of the Vidian nerve which arises from the carotid plexus; and in the inferior maxilla their connection with the sympathetic system is through a nerve branch from the facial artery which enters the submaxillæ ganglion, through the chorda tympani, and also the otic ganglion, from a branch arising from the plexus of the middle meningeal artery."

Burchard believes that the nerve-supply of the pulp is from the branches of the dental trunks proper, though admitting that nerves pass over the alveolar rim into the pericementum. In mature teeth he is not certain as to the point of entry. But in a figure showing a cuspid tooth at thirteen years the nerves one-third of

the way up the canal are seen to consist of several bundles of medullated fibres which follow the course of the main blood-vessels, splitting into fibrillæ, "beneath the layer of odontoblasts, with which they have a doubtful relationship."

Black states that nerve-bundles distributed to the apical pericementum as well as to the pulp have a common origin,—namely, the inferior dental nerve in the lower jaw,—and that in the upper jaw blood-vessels and nerves together penetrate the antral wall "into channels of the basal portion of the alveolar bone."

In conclusion, let us note the great diversity of opinions prevailing among histologists. Are not these questions of vital importance before we can in any way reliably attempt or even venture to cure the pathologic conditions brought to our notice? How much more important is the histology, embryology, bacteriology, and pathology of the dental tissues compared to the subject of physics by lectures and laboratory, as is now being put in the fourth year of some of our dental colleges when it really belongs to the elementary chemic course. Let us encourage workers to give some time optional or obligatory during the senior or the post-graduate year, and give them better facilities by *money grants through the Association*, whose committee on special research could determine whether the candidate was worthy of support or not, and let the papers be published in the *Journal* if worthy of recognition.

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METHODS IN THE PREPARATION OF TEETH.¹

BY MARTHA ANDERSON, M.D., MOLINE, ILL.

IN preparing sections of teeth for the microscope it is necessary to proceed in different ways according to the structures desired to be demonstrated. For convenience the methods may be divided into, 1, ground or hard methods; 2, injection methods; 3, structural methods; the structural being subdivided into (*a*) general, or those used to demonstrate cellular structures, and (*b*) special, or those demonstrating nervous tissues.

1. The hard or ground method should be used for studying tooth-tissues *in situ*. The different processes, though differing somewhat in technique, all consist in grinding down sections of teeth thin enough to examine under the microscope and then polishing to a smooth surface and mounting in Canada balsam. They are as follows:

Nealey's.—Fresh tissues only should be used, and the method is a rapid one, the sections being ready to mount in thirty minutes. First one side of the tooth and then the other is ground on a dental lathe with a set of emery wheels. The advantages of this method are that the sections do not curl or become brittle.

White's.—Sections of teeth are ground between two plates of ground glass with water and pumice powder and finished with ground glass alone. They are mounted in Canada balsam without heat. Or they may be soaked in ether twenty-four hours, transferred to thin collodion, and stained with fuchsin two to three days, when they are hardened in methyl alcohol and ground down at leisure with ground glass and water only.

Dunkerley's.—Sections are cut off by means of a thin copper disk fitted to a dental lathe and revolving in a trough containing water and fine corundum powder. They are ground on copper disks and a water-of-Ayr stone.

Cowardin's.—From green teeth prepared in turpentine weigh sections are made, then embedded in balsam ground with corundum of four grades successively. They are then polished with the

¹ Read before the American Medical Association, Section on Stomatology, June, 1901.

finest powder—stone lap, dry whiting powder—and the hand, and then mounted in balsam or dry.

Koch's.—Objects are soaked in copal solution, dried, hardened, and cemented to a slide, on which they are ground down on a grindstone and on a hone to the requisite thinness, polished, and mounted in balsam.

Wiel's.—Tooth is extracted and immediately put into alcohol or aqueous solution of bichloride of mercury, to prevent shrinking. In all manipulations (cutting, sawing, grinding, sectioning) care should be taken that the tooth is at no moment without excess of moisture. The pulp is exposed at both ends and fixed in a saturated solution of bichloride of mercury from eight to twelve hours, and washed in water two hours; then hardened in dilute alcohol, the strength being gradually increased to thirty per cent., eight to twelve hours; fifty per cent., eight to twelve hours; seventy per cent., eight to twelve hours; ninety per cent., to which tincture of iodine one and one-half to two per cent. has been added. Stain in borax-carmine. Wash, dehydrate, clear, embed in balsam, and rub down.

McQuillen attaches sections to a slide with balsam and grinds with a hone.

Latimer grinds on a corundum wheel, an Arkansas wheel, then polishes by rubbing on a smooth and dry plate glass.

Bödecker's.—A fresh tooth, or one soaked for a short time in chromic acid, is sliced thin under water and ground as thin as possible upon the corundum wheel of a lathe, always being kept under water. The sections are then placed in chromic acid one-half of one per cent., or saturated aqueous solution of picric acid, to harden tissues and dissolve the lime-salts. They are then stained and mounted.

Hart, after grinding sections thin, immerses them in six per cent. glacial acetic acid, and then treats them in the usual way.

Modifications of these methods have been advised, as those of Smith, Ross, and others.

2. To demonstrate the blood-supply injection methods are necessary. The blood-vessels are filled with colored substances for the purpose of showing their relation to and course through the tissues. Beale's prussian blue is the solution usually used. This mass runs well and has not much tendency to exude from cut vessels. Its formula is as follows:

R Price's glycerin,
Tincture sesquichloride of iron,
Potassium ferrocyanide,
Hydrochloric acid (strong),
Distilled water.

Fearnley introduces Carter's carmine into the aorta of an animal, during which time it is kept warm. After the injection it is removed to cold water:

R Carmine,
Glacial acetic acid,
Gelatin solution (1 to 6),
Distilled water.

Whitman, in injecting, uses the femoral, or, if that is too small, the carotid, or aorta. The animal is immersed in warm water and normal salt solution forced through the vessels to wash out the blood and dilate the vessels, and then the starch injection mass is forced through.

INJECTION MASS.

R Dry starch.....	1.00
Chloral hydrate, two and one-half per cent. aqueous solution	1.00
Alcohol	0.25
Color	0.25

COLOR.

R Dry color (ultra marine).....	1.00
Glycerin	1.00
Alcohol, ninety-five per cent.....	1.00

Lepkowsky injects Berlin blue and then hardens the tissues *in situ* in formol, fifty per cent., for two days. Then he decalcifies in nitric acid, ten per cent., from eight to fourteen days, and mounts in celloidin.

Huber used Ehrlich's methylene-blue *intra-vitam* method. After forcing through a normal salt solution, methylene-blue in normal salt solution was injected through the carotid until the lips assumed a deep-blue color. Thirty minutes later the lower jaw was removed and cleansed with a dry cloth. The teeth were removed and the pulp placed on a slide in normal salt solution. In a few moments the characteristic blue color was found to have

developed in the axis cylinders of the peripheral nerves. In fresh preparations the axis cylinders stained blue; the other tissues not at all, or faintly. Unfortunately, preparations prepared thus always fade unless a fixative is used promptly. As a fixative a saturated aqueous solution of ammonium picrate (Dogiel) or a solution of ammonium molybdate (Bethe) may be used. The former preparations are mounted in a mixture of glycerole and the ammonium picrate solution; the latter dehydrated and mounted in balsam. Prepared in this way the tissues become so clear that a small pulp may be examined *in toto*. These methods Huber used in a rabbit; they cannot be employed in pulps of human teeth.

With these two methods, the hard and the injection, I have had little experience, having worked mainly with pulps and decalcification of teeth. To demonstrate tissue-structures it is necessary to stain microtome sections with different dyes to bring out the different tissues. Either pulps themselves are used, or decalcification of the hard structures is necessary.

3. *Decalcification Methods*.—Hopewell Smith decalcifies in five per cent chromic acid, or, after hardening in Müller's fluid from three to four weeks, removes to alcohol from ten to twenty days, washes, seals the apical foramen with collodion and places in twelve cubic centimetres of ten per cent. hydrochloric acid for fifteen hours, then adds one and five-tenths cubic centimetres nitric acid, and in forty hours one and five-tenths cubic centimetres nitric acid again. In from seventy-five to eighty hours they are washed in lithium carbonate for a half-hour and cut by freezing method, celloidin or paraffin. If the freezing method is used, they should be dehydrated in thirty per cent., seventy per cent., ninety per cent., and absolute alcohols successively for one minute each to prevent shrinking.

Lepkowski's Method.—Pieces one-half millimetre thick are placed in pure formic acid, three pints, and one per cent. aqueous solution gold chloric, six pints, for twenty-four hours; then washed in distilled water and placed in gum arabic and glycerin for twenty-four hours, washed, and embedded in celloidin or paraffin.

KLEINENBERG'S FORMULA.

R	Picric acid.....	100.00
	Sulphuric acid (strong).....	2.00
	Filter and add distilled water.....	300.00

EBNER'S FORMULA.

R	Hydrochloric acid.....	1.00
	Sodium chloride.....	10.00
	Distilled water ad.....	100.00

HAUG'S FORMULA.

R	Phloroglucin	1.00
	Nitric acid.....	10.00
	Distilled water.....	50.00

After this solution tissues stain well and all elements except blood are well preserved.

Schaeffer used a saturated aqueous solution of picric acid containing two per cent. hydrochloric acid and a crystal of picric acid added from time to time. When soft, tissues were placed in alcohol containing lithium carbonate. The alcohol should be changed till no color comes away. Embed in paraffin.

Squire's Method.—Hydrochloric acid, 5, glycerin, 95, softens slowly, and does not interfere with structure.

Huber hardens in Müller's fluid for several weeks and then transfers to equal parts of nitric acid, ten per cent., and hydrochloric acid, one per cent.

Bödecker advised chromic acid, one-half to one per cent., used in large quantity and renewed frequently. To enforce the action of the fluid he added a small quantity of dilute hydrochloric acid (one-half drop). This is a good method for softening teeth when still in the jaw. It can be stained with carmine, logwood, or gold chloride. If gold is used, wash well in distilled water to free from alcohol before placing in gold solution (one-half per cent.). Stain one-half to one hour, thoroughly wash in distilled water, and expose to daylight several days.

Lactic acid acts well upon teeth (if diluted sufficiently) by dissolving the lime-salts much faster than the chromic acid. Specimens decalcified in lactic acid are not distinct enough for study with high powers, hence after being softened with lactic acid they must be placed in chromic acid for several weeks.

Boll advises chromic acid, one-thirty-second per cent., and gradually increased in strength until in two weeks it contains two per cent. or over. Decalcify from five to six weeks.

Hopewell Smith.—For jaws of embryo mammals: Strip jaws of all tissue except the gums, wash in normal salt solution and

place in Müller's fluid for two weeks. Change often, remove to alcohol, and cut by freezing microtome, celloidin, or paraffin. Its advantages are its simplicity, the odontoblasts are of large size, and the formation of the dentinal fibrils are at their highest stage of development. It affects but little the relative positions of dentine, odontoblasts, and pulp.

In using the tooth-pulps alone great care must be exercised in obtaining them that the pulp may be obtained in its entirety. While some workers claim that all that is necessary is to crack open the tooth and lift the loose pulp out, my experience leads me to think differently. Many pulps that I have worked with have had small pieces of dentine attached along the sides. These were unnoticed at first until the knife struck them in microtoming.

In some sections the tomes could be seen extending out from the odontoblasts along the free border of the section; in others these were present only in places, and many were perfectly free from them. Some investigators believe that the nerve-fibrils pass up between the odontoblasts and enter the dental canaliculi side by side with the dentinal fibres. Others differ; but whether so or not, one thing is certain, that there is an intimate connection between the tomes and the dentine, and that, being so delicate, great care is necessary in handling them. Boll claims that the odontoblasts, by their long processes, which extend into the dentinal canaliculi, are held firmly to the inner surface of the dentine, appearing to the naked eye as a thin, mucus-like film. If this film is scraped off with a knife and brought under the microscope, we see, besides peripheral cells, some parts of the inner pulp-tissue. He therefore advises splitting a tooth and placing pulp and tooth in a very weak solution of chromic acid (one-thirty-second per cent.) for one hour. Remove the loose fragments of tooth and with a thin, sharp knife go between pulp and dentine close to the walls of the pulp-cavity. In specimens obtained thus large quantities of non-medullated nerve-fibres are seen towards the periphery of the pulp, which, when removed in the ordinary way, adhere to the pulp-chamber.

Robertson holds that when a tooth is broken open the odontoblasts cling to the dentine and the pulp remains free, thus proving that the attachment to dentine is stronger.

For ordinary staining, logwood, logwood and eosin, and Van Giessen are good stains; but for special staining, and especially

for the nervous tissues which we are so anxious to bring out, special stains are necessary. Of these, the following are largely used: Golgi's stain for demonstrating nerves; Ehrlich's methylene-blue shows axis cylinders of peripheral nerves; Apathy's double stain for differentiating nervous and connective tissues; Mummery's iron and tannin for fine nerve-fibres; Marchi's med. nerve-fibres; Underwood's gold chloride.

For the odontoblasts, place in six per cent. solution of potassium anhydrochromate for twenty-four hours, and tease in picrocarmine. To demonstrate the nerves in the processes of the odontoblasts, Beale crushes a fresh tooth and stains by his method, macerates in strong syrup until soft, examines a few very thin sections, when the acid will be found to render all tissues transparent except the nerves, which are granular.

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BACTERIOLOGY.

BY C. N. PEIRCE, D.D.S., PHILADELPHIA.

OCCURRENCES which are obscure, or their cause not immediately obvious, we term phenomena. When time and experience reveal their application to the economy of life, they are termed natural law. Not infrequently the development of the individual to unravel the mystery and demonstrate its value to present and succeeding generations is tardy in materializing.

The solar system waited many centuries for Galileo, Kepler, and Newton to satisfactorily explain its structure, operation, and complex movements.

Fabricius, Harvey, and Malpighi made generation, physiology, and anatomy of the human body comprehensible by years of patient study.

Franklin, by interrogating the lightning in the clouds, made electricity the servant of man, which, by the transmission of thought, annihilates space and time.

Buckland, Lyell, and Agassiz bore eloquent testimony to the natural but sublime history of the rocks and fossils, and the age of man and animals was greatly extended.

Cuvier, Carpenter, and Spencer elaborated the principles governing society and the trend of the simple to the complex, and established the sciences of biology and sociology.

Lamarck, Darwin, Wallace, and Huxley demonstrated descent with modification, and established the origin of species and principles of evolution.

Cope, Leidy, Le Conte, and Marsh faithfully studied laws of development, vertebrate zoology, paleontology, and comparative anatomy, and established the close relationship of animals.

Faraday and Tyndall established the movements of the glaciers, studied the drops of water, the rays of light, and proved the reign of natural law.

M. Louis Pasteur, engrossed in his experiments of crystalline faucets in the tartrates, and the paratartrates, and in the molecular symmetry and dissymmetry of crystals and the range of chemical processes apart from the play of vitality, had his attention directed to ferments by a German manufacturer of chemicals, who found that mineral substances sullied with organic matter of various

kinds fermented when dissolved in water and exposed to summer heat. In this solution Pasteur found the fermentation due to the multiplication of a microscopic organism, which in the liquid found its proper aliments. In this little organism he recognized a living ferment, which on examination he believed to be analogous to the yeast-plant, the alcoholic ferment to which his attention had been directed by Schwann.

Following this, Pasteur made some remarkably successful experiments with the seeds of the common mould, *Penicillium glaucum*. This brought the noted scientist unexpectedly amid the phenomena of fermentation, and that ferments in all cases are living things was his conclusion, also that the substances formerly regarded as ferments are, in reality, the food of the ferments.

He proved the ferment of lactic acid to be an organism of one kind, that of butyric acid to be an organism of a different kind. Following this he was led to the belief that the capacity of an organism to act as a ferment depended on the solution in which it was immersed, and also its power to live without air. The fermentation of beer suggested to him this idea. The yeast-plant, like many others, can live either with or without free air. In contact with the latter it is spared the labor of wrestling from the malt the oxygen required for its sustenance. He finally divided these microscopic organisms into two great classes, which he named, respectively, aërobies and anaërobies, the former requiring free oxygen to maintain life, the latter capable of living without free oxygen, but able to wrest this element from its combination with other elements.

It is to Schwann, however, that the scientific world is indebted for the first successful effort in sterilization. He placed decoctions of meat in flasks, boiled them, then supplied them with calcined air, the power of which to support life was unimpaired, yet fermentation or putrefaction in these vessels never occurred. Hence the legitimate conclusion was that putrefaction was not due to contact with air, but to something suspended in the air which heat would destroy. This something consisted of living organisms, which nourished themselves at the expense of the organic substance, and caused its putrefaction.

The acetic fermentation was next studied, which was found to be the result of a minute fungus, the *Micoderma aceti*. By this the sugar of the grape-juice is transformed into carbonic acid

and alcohol, the latter remaining in the wine. The manufacture and maladies of wine occupied his serious attention. Each of the disorders of wine was traced to its specific organism, which, acting as a ferment, produced substances agreeable or otherwise to the palate. Through the influence of the illustrious Dumas, Pasteur took up the investigation of the diseases of the silk-worm at a time when this industry was in a state of ruin. Acquainted as Pasteur was with the work of living ferments, he was prepared for any emergency. Within the circulation of this insect he discovered the cause of the epidemic. The diseased corpuscles he followed through all the phases of insect life,—the eggs, the worm, the chrysalis, the moth. In the latter it reached development so distinct as to render its recognition immediate. From healthy moths healthy eggs were sure to spring; from healthy eggs healthy worms; and so on through the cycle of changes. Care in feeding and isolation of diseased from healthy worms and eggs the trouble was surmounted and the industry re-established. It was no hypothetical problem; the trouble was in a definite organism. Wherever ferments are utilized, the microscope and results must test the quality of the true torula, or yeast-plant. The germ theory of infectious diseases was the result of the researches of Pasteur and Schwann.

Pasteur was not a physician, and he did not feel himself called upon to trench upon the domain of the healing art, but by his studies and experiments he established the parasitic character of the several diseases affecting fowls, sheep, dogs, and cattle.

The work so valuable, done by Dr. Koch on splenic fever (malignant pustule), with the life history of *bacillus anthracis*, the contagion of this fever, is but a service in honor of Pasteur. The recital of the foregoing evidences of increasing knowledge and demands of the age have daily utilized all that has been evolved, until the Philosopher's stone and the transmutation of metals are relics of the past.

Alcoholic fermentation was for many years supposed to be the seat of active, spontaneous, self-regulated change; its results were known, but its origin and processes had not been revealed. The chemist assumed that the decomposition which took place was due to the aggressive action of the oxygen of the air, and the preventive process was simply its exclusion.

On the publication of Pasteur's work this spontaneous idea

entirely passed out of mind, though it had been accepted as a fact even by scientific men who held that it was the simplest explanation of the origin of the swarms of microscopic organisms observed in putrefying liquids or infusions. When we recall the universal ignorance concerning the nature and complexity of various forms of life, and note the utter unreliability of any theory regarding them, it is not surprising that abiogenesis should have been held so firmly in favor and with so much confidence.

Yet Leeuwenhoeck, a microscopist of marked ability for his time (the seventeenth century), held that the entire absence of abiogenesis in the higher forms of life made it very improbable that the lower or even lowest should have such an origin; these conclusions, while not based on any recognized scientific evidence, were certainly wise, even though intuitive or instinctive.

The germ theory of disease has done much towards relieving the world of a sorry superstition. Pestilences, epidemics, plagues, are now, with scarlet fever, measles, small-pox, whooping-cough, and numerous diseases with which the human family are afflicted, looked upon as due to natural causes rather than the visitation of an angry God.

Bacteriology has been defined as a subdivision of microbiology and as the science of the culturable micro-organisms, but it must not be inferred that all such organisms are harmful to more complex or highly organized beings.

The number that are not only benign but quite essential to the life of man are greatly in excess of the harmful or malignant type. It would be difficult to conceive of the condition of our environment were we but for a limited time to be deprived of the helpful though unseen activity of the myriads of these organisms.

Professor W. S. Sedgwick brings this matter clearly before his readers when he refers to their influence in the following terms: "Without their activity the habitable world and the sea would become one vast charnel-house, because there would be no adequate agency for mineralizing dead matter. . . . We have only to think of their helpful and wholesome unseen activity in removing from our view the dead animal bodies which would otherwise cover the earth, the dead leafage of the autumn, the worn-out trunks of trees, and the waste matters of human and animal life, in order to appreciate in some measure their fundamental importance in nature.

. . . When to this we add their tendency to cause the destruction of valuable organic matters, such as food and timber; their function in producing those fermentations, putrefactions, and poisonings of the human body which we know as epidemics, plagues, pestilences, infectious diseases, suppurating wounds, gangrene, and the like; when, furthermore, we consider their causative participation in such universal, familiar, and important processes as bread-making, brewing, vinegar-making, the fermentations of milk and its products, butter-making, cheese-making, lactic acid manufacture, tanning, and nitrification, we are in a position to understand something of the scope and significance of the culturable micro-organisms, and therefore of bacteriology, from a practical point of view."

With these important facts before us, it should be borne in mind that microscopic life is, in its largest influence, beneficent to humanity; that the varieties associated with disease are comparatively few in contrast with the others. While these minute organisms have been definitely identified with special diseases, many have serious doubts as to whether it has been satisfactorily demonstrated that they are the cause and not the product of the condition.

The presence of these organisms in nearly all diseases is fully recognized, but their influence, as we see, is somewhat conjectural. The query is, Will future generations modify the modern teaching?

From published reports we learn that physicians have much difficulty in establishing positively the absence of the bacilli in certain diseases, hence the embarrassment in declaring that the disease does not exist; yet their presence would be considered positive evidence of the disease. This difficulty must be a great source of confusion to the diagnostician, and must be increased by another uncertainty mentioned in their reports,—namely, that they, the bacilli, vary greatly in number within a limited time. Another serious difficulty encountered is that bacilli have been found on nasopharyngeal surfaces and on the tonsils when there has been no systemic disturbance, and also after serious trouble has subsided their presence has been recognized. If these statements are correct, they must add to the uncertainty of their influence and make them a precarious feature of a diagnosis.

The origin of bacteria and the study of bacteriology have been

extremely interesting scientific features in the last thirty years. The scope, or field, is broad and valuable, offering great compensation for laborious and painstaking cultivation, but this must be done with a full appreciation of the danger of careless and hasty conclusions.

Reviews of Dental Literature.

THE PREVENTION OF NAUSEA AND VOMITING DURING ANÆSTHESIA.—In the *New York Medical Journal* of December 15, 1900, Hirschman reminds us that one of the most annoying things in connection with the administration of chloroform and ether as general anæsthetics is the almost invariable nausea and vomiting produced by their inhalation. The patient, if a person of extremely nervous temperament, is usually nauseated when the administration of the anæsthetic is started; or, if he is a person of strong and robust build, during the stage of excitement. He may escape, however, until the operation is well under way, when, if allowed to come out of the anæsthetic for any reason whatever, he invariably begins to gag and usually to vomit. In quite a number of cases there is no trouble until the patient is returned to his bed, and allowed to recover from the influence of the anæsthetic, when repeated attempts to vomit sometimes undo the good work of the surgeon or gynaecologist.

The new drug, chloretone, is a very valuable hypnotic, antiseptic, and analgetic. A one per cent. aqueous solution is said to be equal to a two per cent. solution of cocaine hydrochloride for local anæsthesia. Chloretone has the advantage over cocaine of having antiseptic properties, and it has no bad systemic effects. As an hypnotic, it seems to act upon the central nervous system, and in doses of eight to twenty grains (a drachm if necessary) it has a most excellent effect; it is not a depressant to the circulatory and respiratory systems. Dr. Hirschman mentions these uses of the drug incidentally merely as a matter of general knowledge, born of actual experience while he was connected with the Harper Hospital and since. The subject of this paper, however, demands

the discussion of the use of chloretone in connection with the prevention of the nausea and vomiting occurring during anæsthesia.

The proposition which presented itself to the writer was this: If vomiting at the beginning of and during the anæsthesia is reflex, and if the vomiting following is due partially to reflex action and largely to the swallowing of the supersecretion of mucus resulting from the action of the anæsthetic on the mucous membranes, why should not a drug which is not a depressant, which is both a local anæsthetic, with pronounced effect on mucous membranes, and a sedative to the central nervous system, be used before anæsthesia to prevent the coincident gastric disturbances?

In accordance with this line of thought, while he was a member of the resident staff of the Harper Hospital, Hirschman began giving chloretone to patients before anæsthetizing them. It was given in doses of ten grains to women and boys under sixteen years of age, and of fifteen grains to men, half an hour before the anæsthetic was to be started. If the patient does not object to it, he prefers giving it dry on the tongue, and following the administration with an ounce or two of warm water. It may also be given in capsules; but the three-grain sugar-coated tablets now on the market are not so desirable in this connection, because of the number of tablets necessary to make the required dose, and because the sugar coating and compression delay absorption somewhat. When the time for administering the anæsthetic comes around, the patient who has had chloretone is calm; nervousness is quieted, and he is in an ideal condition. If a female, she takes the anæsthetic well, takes little of it, and goes under without a murmur, and one almost forgets that there ever was a stage of excitement.

It takes from seven to twelve minutes to completely anæsthetize with chloroform, and up to fifteen and eighteen with ether. Patients who have had chloretone require less of the anæsthetic, and are not so apt to come out of the anæsthesia suddenly during the operation, if the administration of the anæsthetic is lessened temporarily.

Hirschman personally has observed sixty cases in a space covering a little over three weeks. Half of the patients received chloretone, and the other half, for the purpose of comparing results, did not. The operations were of the same class, the operators were the same, and he personally gave the anæsthetic in nearly all cases. The amount of anæsthetic in the cases of patients receiving the

chloretone was from one-third to one-half less than in those not receiving it, and in none of the thirty receiving the drug was stimulation required during the anæsthesia. Out of the thirty receiving chloretone, none was nauseated while being anæsthetized, and three, or ten per cent., were nauseated, and only one of these vomited more than twice on coming out from under the influence of the anæsthetic. Of the thirty less fortunate patients who did not receive chloretone, twenty-four, or eighty per cent., were nauseated and vomited, and nineteen of them were still unable to retain liquid food on the following day; in some of these the nausea and vomiting persisted at intervals for three or four days. The benefits of chloretone in this connection are self-evident. The difference of seventy per cent. in its favor is the most powerful argument for it.

These thirty cases, taken in direct succession, were mostly gynæcological; on account of their sex these individuals were naturally more prone to reflex nervous disturbances. It was in the hope of overcoming this reflex irritability that he sought for a remedy, or, to speak more accurately, a prophylactic. In the cases under observation, chloroform was the anæsthetic usually chosen and always preferred; ether was given only when chloroform, for some reason or other, was contraindicated, or the operation was unduly prolonged.—*Therapeutic Gazette.*

Reports of Society Meetings.

AMERICAN MEDICAL ASSOCIATION, SECTION ON STOMATOLOGY.

DISCUSSION ON DEGENERACY OF THE PULP.

Dr. R. R. Andrews, Cambridge, Mass.—I will say in the first place that I was delighted with the paper by *Dr. Latham*,—with the care with which it was prepared and the suggestions which she made. I do not see how the subject could possibly have been treated any better or the photographs been made any more beautiful.

In regard to the paper of our secretary concerning this matter

of preparing tissue, I have tried all these various complicated methods, and with more or less success, but I finally came to the conclusion that if I got my tissue as nearly alive as possible, and used the simplest possible means of preparing it, I got in every case the better results. I have worked mostly on the heads of calves, because it seemed to me they showed the tissue so well. I have taken the calf at birth, taken out the teeth, and transferred them to a low per cent. of chromic acid solution, one-half of one per cent., and if necessary I would use some stronger acids, hydrochloric, for instance, a very small per cent. I cannot tell just exactly the combination which I used. I placed the tissue in the solution and tested it from day to day, and as soon as I found the area of the tooth sufficiently softened to use the microtome I would cut sections until my microtome reached hard tissue. Many sections which show well with low powers are almost useless when used for high-power work. The tissue seems to run together, and there is no definite picture and no differentiation of the tissue. Sections for high-power work have got to be more carefully prepared, and it takes a long time. I have always been in favor of working as near life as possible soon after preparation was taken from the live body, and in the simplest possible way.

I have been very much pleased with the character of the papers that have been read, not only to-day, but yesterday also.

Dr. G. V. I. Brown, Milwaukee, Wis.—The symposium interested me a great deal, although I have somewhat of a feeling of disappointment that we could not have gone on now from where we left off and put in at least a day in pursuing this subject a little farther. I would have liked to see it developed along the line of pathological changes that occur in the pulp, so that under the microscope we could arrive at some definite etiological idea. I have had a great many interesting cases the past year, but in a large measure the benefit of them has been lost, because in our laboratories in Milwaukee we do not seem to have any distinguishing way of arriving definitely at the pathological changes that take place in the pulp-tissue. I have in mind one case in which there was a spasmodic affection of the muscles of the face, accompanied by a recurrent pain which occurred at intervals of one and one-half to two minutes, so severe that the life of the patient was almost unendurable and the hyperæsthesia at the posterior portion of the mouth and pharynx made it almost impossible to take nourish-

ment. The difficulty was finally located in the tooth-pulp and cured, and although that pulp was carefully preserved and an attempt made to treat it so it would show the characteristics of that condition, we were unable to arrive at anything which we felt we could give out as scientifically correct. That is the reason why I think the effect of this symposium will be far-reaching, and we will hear more of it, not only in this section, but in other societies, and I hope what has been begun to-day will be carried farther before this question is dropped.

Dr. R. R. Andrews, Cambridge, Mass.—If Dr. Talbot, in the large number of teeth he examined, had made a careful study of them, it might have been of great benefit in this direction, and he would have found that the pulp even at full maturity of the tooth is of great service. It is a mistake to suppose that the pulp has lost its function when it is fully formed. I know it is the belief of many that when teeth are fully formed the pulp might as well be killed, but those who have studied this subject most will tell you that a healthy dental pulp has a function to perform through life.

Dr. Eugene S. Talbot, Chicago.—I hardly think the chairman and Dr. Brown have quite grasped the situation in regard to these papers. The general subject of this symposium is "Preliminary Work." The teeth selected by myself were taken at all stages by men who make a business of extracting teeth. Age was hence not taken into consideration in a general way. The object of the paper was to give my own results only. Dr. Latham, Dr. Anderson, and myself have undertaken a large amount of work, which is all preliminary, in a systematic way, taking up the general conditions of the teeth in a healthy state and from embryologic and nosologic points of view. There is one point in dental literature to which attention was paid, giving credit to whom credit is due. One subject of these papers is to summarize the literature. One-half of it has been given. The idea is to compile all literature upon the pulp before generalizing. That has been my method throughout life. All my writings show that I feel obligated to give due credit to those that have done work before. After that I take up the line of work, and in all the points where the work corresponds with that previously done to give due credit. If it differ, I show wherein difference occurs. That is the only way in which to make scientific research.

Dr. Vida A. Latham, Rogers Park, Ill.—I would like to say that I am in the centre of a large city, but I have had extreme difficulty in getting hold of material. Our library boasts of a medical department, but it is almost devoid of dental literature except a few current journals. The Northwestern Dental School has a library, but it is rather difficult of access, and then the papers are either in Swedish or Hungarian, and I am ignorant of those languages. I have tried to be pretty careful in that regard, and I have found papers that were under men's names that were little familiar, and when I made a careful search I have found they were not their papers at all. So I have tried to be careful on that point. It is rather difficult to follow the literature. I have used the *Cosmos* index, and it is a very excellent one, and I have used Dr. Taft's index, which is also a very good one, and in that way I have not missed any good articles in the journals, and I would be glad to hear of any good papers that have been published.

There is another point in pulp methods that Dr. Anderson has brought out. I have tried to use simple methods. I believe the only successful methods that are being used are those which take in the jaw itself. It is almost useless to take out the tooth, because you break the pulp and the continuity is broken. It is difficult to get a jaw or teeth from the human unless you are attached to a hospital. There is a prejudice in America against the post mortem; it is almost impossible to procure teeth. A point that strikes me very forcibly is, Why should we use the term "degenerate" in the embryo? Take the new works on embryology, take the American works, take any of the standard works, and you will find nothing of degenerate pulp; the name does not occur. When I think of the importance of it, when the literature is silent on it, how shall we treat secondary dentine? Why should we take out the pulp? How can we treat the pulp when we do not know what it is? It is impossible. Out of ten pulps, nine are pathological. I have tried to follow them down with hydrochloric acid. The men who do dental histological work take the old methods. Dental histologic methods must be studied with dental tissues. What have we got to experiment with? Dr. Anderson is very fond of chlorine, but after a few years the specimens will disappear. My specimens that I mounted ten years ago I can find no trace of, and under those conditions I feel a little doubtful

about using chlorine. A man may write to you asking if you have certain slides, and therefore you must keep the specimens. I have written to Dr. Sudduth for specimens, and he has replied that he did not keep his slides, as they were so easy to get. Personally I do not agree with him. I have put in six months on one slide, and then had difficulty to secure it. This is mostly preliminary work, and now we expect to go to work with calves, with the embryo from the stock-yards, and find out where the pulp comes from. Some say it forms the odontoblasts, and some say it does not. If the secondary dentine exists, there must be secondary and not primary nerves.

Dr. G. V. I. Brown, Milwaukee, Wis.—I am glad to hear what Dr. Latham has said, and am also glad to hear the statement about the preparation of specimens. So far as I have tried the work it has been unsatisfactory. A large proportion of the methods are comes from. Some say it forms the odontoblasts, and some say it does not. If the secondary dentine exists, there must be secondary effect in demonstration; and then you must have a perfect specimen.

Dr. R. R. Andrews, Cambridge, Mass.—Just one word in regard to Morgenstern's demonstration. I think he used the Golgi method. He found that the dentinal fibrils within the dentinal canals were wound about by delicate fibres that had every appearance of being delicate nerve-fibrils coming from the pulp. I worked with this method for more than six months with entirely negative results. It shows that it is a difficult problem to solve.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A MEETING of the Institute was held at the office of Dr. J. Adams Bishop, 30 West Forty-eighth Street, on Tuesday evening, May 8, 1901, the President, Dr. J. Morgan Howe, in the chair.

The minutes of the last meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Dr. George S. Allan.—Shortly after Dr. Frederic Bogue read his paper there was a synopsis of it published in the *Dental Re-*

view. Almost coincident with the appearance of this in the *Review*, I received a letter from Dr. Miller asking me if I would bring before the Odontological Society his views on this subject as published in the *Independent Practitioner* of 1883, pages 632, 633, and in his book, "Micro-organisms of the Human Mouth," page 196.

After writing to Dr. Miller I received a letter from him stating that he had supposed the paper had been read before the Odontological Society, and asking me if I would bring the matter of his paper before the Institute of Stomatology.

In the article published in the *Independent* Dr. Miller mentions having broken up a number of teeth free from caries and producing decay artificially in a mixture of bread and saliva. The phenomenon of white decay was produced with greatest accuracy. Various stains, such as tobacco, etc., were also used, and gave the varying degrees of color noted in decay in the mouth. Where enamel was hard and dense, without crack or blemish, it had not even lost its lustre. He mentions that this experiment shows what a vast difference the structure (density) of the tooth makes in its resistance to decalcification, and that it offers an explanation why all teeth do not decay alike; that a dense tooth covered with enamel, intact at every point, would probably resist for years the action of an acid saliva to which a soft defective tooth would succumb in a few weeks; also the fact, established by the above experiment, that the rapidity with which tooth-tissue is acted upon by the acid of tooth caries is inversely proportional to some multiple of the density of the tooth, he considers to be of greatest importance, as furnishing a key to the solution of the question of the great difference in the liability of teeth in different persons, or of different teeth in the same person, to decay.

In his book, "Micro-organisms of the Human Mouth," Dr. Miller speaks of the production of artificial decay by means of bread and saliva, and says that it cannot be distinguished from the decay occurring in the mouth.

Dr. S. E. Davenport.—I would like to ask Dr. Allan if Dr. Miller in his letter gave us any hope that he would give the Institute a paper upon this subject, and also if Dr. Miller expressed his approbation of Dr. Frederic L. Bogue's paper?

Dr. Allan.—I regret very much that I did not bring Dr. Mil-

ler's letter. Dr. Miller does not say distinctly that he will prepare a paper, but he intimates that he has something in preparation and also that when it is ready the Institute may have it. From his letter it is very evident that his views coincide entirely with the results of Dr. Frederic L. Bogue's experiments. I am very sorry to say that I have learned indirectly that Dr. Miller is not in the very best of health, and undoubtedly he does not care to rush into print until he is fully prepared. I shall write Dr. Miller at once, and hope to have something to communicate from him later.

There is one little point that I would like to bring before the Institute, and that is a method which I have of filling roots with oxyphosphate. I have heard it advocated recently to fill these roots with a syringe, the fine point of which will go to the bottom of the canal, and as the thin filling-material is forced into the root the syringe point is gradually withdrawn. This would be an excellent way, no doubt, but I have never seen a syringe point that would go to the bottom of a root-canal. My method is to wrap a little cotton round a stiff probe and with this work the oxyphosphate down into the root. I can do this about as quickly as one could syringe it into the canal, provided he could get a syringe that would go into a root-canal. I do not see but what this meets the requirements. I mix the oxyphosphate rather soft.

Dr. E. A. Bogue.—Some years ago I used ethyl chloride on a certain occasion to obtund sensitiveness in a lower molar, and as my victim is now in the room I wish to say a few words regarding ethyl chloride for this purpose. Dr. Flagg says we talk about our successes and not about our failures. It is one of my failures which I will mention. At that time I did not understand the possibilities of ethyl chloride, and I used it to remove the pulp. Both the patient and the operator had a dreadful time. Since then I have tried it again and again, and I have been quite successful in obtunding sensitive cavities sufficiently to excavate without pain in nearly all the upper teeth and in the lower front teeth, but not very successfully the lower posterior teeth. I had a very timid little girl in my chair to-day, thirteen or fourteen years of age. I excavated four very sensitive cavities, and I think there were just four tears. I use for this purpose the ethyl chloride, which comes in tubes with a bent nozzle, over which there is a cap with a spring handle, which can be lifted at will. I put quite a large

piece of cotton loosely in the cavity, and apply and remove alternately the stream of ethyl chloride to this cotton once in two or three seconds.

The President.—Is the bottle referred to the one in which the chloride is furnished?

Dr. Bogue.—Yes.

Dr. Davenport.—The secret of Dr. Bogue's present success with ethyl chloride is probably due to his method of applying it. The constant stream used by most operators causes such rapid evaporation that the pain is intense. If the stream is stopped occasionally, the benumbing influence of the drug may have some effect.

Dr. Bogue.—Of course, after the cavity has become insensible to the stream of ethyl chloride the cotton can be removed and the stream thrown directly into the cavity. This, however, should not be done for more than two or three seconds.

The President.—Does Dr. Bogue think this method superior to cataphoresis?

Dr. Bogue.—Mr. President, cataphoresis is never mentioned up our way. It is so far back that I have forgotten all about it. Intense heat and intense cold are both benumbing influences. Both will anæsthetize to a degree. Heat will cause the patient just about as much pain as the chloride of ethyl. After a few seconds (ten or twelve) the pain will cease. After this point the difference is, that the hot air has to be constantly applied.

The chloride of ethyl can be applied directly upon the surface of a tooth, benumbing the whole tooth, thus enabling the operator to remove an amalgam filling. A gentleman came to me some years ago with an upper cuspid tooth which had become so sensitive that he could not endure it any longer. I told him to stop in next morning early and I would remove the pulp and fill the cavity for him. He did not believe it. He came in. There was no cavity in the tooth. By means of the chloride of ethyl I thoroughly anæsthetized the tooth, drilled into it, and removed the pulp; then filled the tooth and sent him away before nine o'clock. He said it was done absolutely without pain. However, this is only one of the various methods of relieving pain.

Dr. H. W. Gillett.—There are two questions that I would like to ask. One is whether there is any injury to the pulp of the

tooth by the use of the chloride of ethyl? and the other, if there is any pain on the tooth regaining sensation,—anything corresponding to the pains in the fingers as they regain sensation after being severely chilled?

Dr. Bogue.—I have never seen any injury to the pulp when the process is not carried beyond what is necessary to obtund the sensation of the dentine. I have noticed a little pain on recovery a few times. I remember one case where it was some time before the patient and I could come to terms regarding the payment of his bill, because of continued sensation in a cavity which extended under the gum.

Dr. George F. Eames's paper on "The Treatment of Certain Oral Expressions commonly designated as *Pyorrhœa Alveolaris*" was then read.

(For Dr. Eames's paper, see page 605.)

Dr. C. O. Kimball.—Dr. Briggs, of Boston, not being able to be present this evening has forwarded his discussion, which I will read.

"I am very sorry not to be with the Institute in person, for written communications not read by their authors are apt to fall flat, and were I there I should receive some inspiration from the presence and remarks of the other members. There is little or nothing left for me to add to what has already been said on this subject, and the only excuse for saying anything lies in the fact that in spite of all that has been said and written there are still many practitioners of good standing who practically tell their patients that there is nothing for the relief or cure of *pyorrhœa alveolaris*. The fact is that we do relieve and do cure a very large proportion of the cases that present themselves. Let us briefly review what we know about this disease. First, its etiology. It may be due to local or constitutional conditions, alone or combined. Local treatment undoubtedly helps all cases, but it is equally true that many cases could be much better helped did we know the constitutional cause and give treatment accordingly. We know some cases to be of syphilitic origin, and suspect many, many others. In these cases when antisyphilitic medicines are given in connection with local treatment the results are magical.

"Auto-intoxication is another cause which when diagnosed may be treated by dieting and eliminants with satisfactory results. As time goes on we shall unquestionably add to our list of con-

stitutional causes, and, with increased ability to diagnose them, more rapid and satisfactory results from treatment will follow.

"We must not forget the influence of metallic poisons in producing pyorrhœa alveolaris, whether absorbed accidentally or as the result of drugging. But, however much we may add to our knowledge of constitutional causes and constitutional treatment, there still remains the fact that many cases are due to local causes and call for local treatment only; also that all cases from local or constitutional causes are materially helped and sometimes cured by local treatment alone. I will not weary you with discussion of the pathology and diagnosis of this disease, but will pass on to the question of treatment, local treatment.

"For convenience let us divide the cases into four classes,—(1) the hopeless; (2) the very bad; (3) the bad; (4) the curable.

"In the first-mentioned, or hopeless, class we find the tooth extremely loose, the pockets very extensive, reaching the apex of the root at various points, and containing pabulum as well as pus; the alveolar process practically absorbed, the pulp dead, and pressure on the tooth causing pain. The treatment in these cases is extraction.

"In the next class, or 'very bad,' we find a tooth quite loose; deep pockets extending at one or more points to the apex of the root; pulp in many cases dead; nodules of tartar difficult of access (as between roots of upper molars); discomfort on pressure. In these cases extraction and replantation offer almost the only sure means for the removal of the nodules. Where, however, they can be reached one need not extract, but the pulp should be destroyed and the root filled. These teeth should receive steady reliable support from some form of splint, which may be worn six weeks or a lifetime, as the case may require. Prognosis, unfavorable.

"The next class, or 'bad,' includes the teeth about which the pockets are not deep enough to reach the apex, but which are more or less loose and irritable and with the tartar scales often in inaccessible regions. If this latter condition obtains, extraction and replantation are in order. In any event a permanent or temporary splint should be adjusted, the pulp removed, and the root filled. In my opinion this is a *sine qua non* in the treatment of this class of cases. Prognosis, favorable.

“The last class, or so-called curable cases, are the only cases we ever ought to see, and will ever see when the profession become educated in the diagnosis and treatment of the disease. When due to local conditions alone it takes about five years to produce the third class, or ‘bad’ cases, and every patient who cares for his teeth at all comes under observation at less intervals than that, and the patients in whom constitutional disturbances are at work are pretty sure to come under observation while they, the constitutional disturbances, are operating.

“These cases call for the treatment that the other cases previously mentioned demand, and in addition, the treatment which should be given to all other teeth not already affected, as a means of prophylaxis. This treatment can be summed up in the one word ‘cleanliness.’ Alas! how few of us seem to know what cleanliness means, or the methods of producing it! Dr. Smith, with his painstaking polishing of each tooth individually, and Hare, with his sterilizing, only emphasize a principle which if once thoroughly inculcated could be worked out by every practitioner without following the special instructions of any one man.

“There are numberless instruments for removing the tartar. I do not suggest any particular one; I only say, *get the tartar off*. There are many antiseptics. Take your choice, but make the pocket aseptic. There are enough stimulating astringents. Use one, and give tone to the gum while favoring new growth. There are solvents for viscid fluids (I might almost call them greasy) which surround the neck of teeth with pyorrhœa, and there are variations in the technique of polishing those necks to make them self-cleansing and allow the gum to lie close with a thin clear margin. But this is not an A, B, C class, and I will not try to teach methods, only begging you to keep constantly in mind the underlying principles, and reminding you that, with the idiosyncrasies of patients, an astringent is not always an astringent and no one drug is ever going to fit all your cases.”

Dr. Charles F. Allan.—Mr. Chairman and gentlemen, great merit is usually accompanied with considerable modesty, as we have seen in the case of the essayist to-night. Certainly a more practical and helpful paper could not have been given us. It is possible that, as regarding the etiology of the disease, I might in some ways differ with him, but in the treatment I am certainly at one with him. He speaks of his instruments. According to

my ideas of this affection, instrumentation is most necessary. I think it was Dr. Mitchell who, in a paper recently published in the *Dental Cosmos*, spoke of this disease as hereditary diathesis plus intemperate feeding. What he means by intemperate feeding is the improper assimilation of the nourishment taken into the system. Now, in describing the etiology of pyorrhœa, I would say "*hereditary diathesis*, plus advancing years, plus intemperate feeding." By this I mean to say that this is a condition and not a disease; that it is a condition mainly dependent upon advancing years; that as occasionally we see very young persons lose their hair, or young persons with gray hair, so do we occasionally find this condition in young people; it is, however, simply an indication of advancing years, helped on by heredity and faulty metabolism. The teeth are dermal in origin, the same as the hair, and why should not their environment be affected in the same way? I think, then, we should bear in mind in the treatment of pyorrhœa that we are treating a condition and not a disease. In the treatment the removal of every particle of calcic deposit is the first essential. The essayist has spoken of dipping his instruments in a solution of carbolic acid, which is a very good thing. I find that some patients object very strongly to the smell of carbolic. I have a habit, when cleansing teeth, of holding my instrument frequently under a stream of running water. He spoke of using compressed air to rinse out under pressure. Compressed air is a very useful adjunct to every office. My attention has recently been called to a syringe, the platinum points of which are removable, so that they can be thoroughly sterilized by heat. He spoke about using a rubber brush to massage the gums. This undoubtedly would be a very good thing unless it means the giving up of the bristle brush. I think both should be used. I thought, on looking over the synopsis of the paper which was sent me, that it would treat more on the etiology of the conditions, but I am very glad that it has taken this more practical turn. Whether every one here believes Dr. Eames's idea that it is a disease, or takes up with my suggestion that it is a condition, certainly every one must agree with Dr. Eames's practical suggestions regarding treatment. I wish to thank Dr. Eames for his helpful paper.

Dr. Gillett.—It has been puzzling me for some time to understand why the chairman of the Executive Committee selected me to say anything on this subject. If there is any one subject more

than another that I know nothing about it is pyorrhœa. I wish to compliment the essayist upon his valuable paper. I have gained from it many ideas. I have not been so fortunate, or so unfortunate, as you may choose to call it, as to have many marked cases of pyorrhœa in my practice. What little experience I have had has been along the line of preventive treatment, and that of course has been the keynote of what has been said to-night. It seems to me that the prevention of a large proportion of the cases of so-called pyorrhœa is a simple matter. Pyorrhœa being a filth disease, its prevention is largely a matter of cleanliness. A large percentage of all the cases can be traced directly to neglect either from the patient or the operator. One of the things that I was in the habit of saying to students was to the effect that if pyorrhœa occurred in the mouths of patients who grew up under their care they were to blame: that either they failed to do their duty as operators, or that they failed to develop sufficient influence to compel proper care on the part of the patients. I do not feel like saying that to-night; I do not feel like saying that I fully endorse it, but nevertheless there is a good deal of truth in it. Working along that line, it has been my theory that the cleansing of the teeth is one of the most important operations that I do in my office, and the operation that is always to be done by my own hand. I do not believe it is the operation which can be left for the assistant, and I try to impress the importance of it upon my patients; neither is it an operation which is to be charged at a reduced rate, for I believe I do my patients more good by this operation than almost any other that I do for them. Along that line comes a word or two regarding instruments. Of course, we all have our own pet instruments. I think the reason why some men fail in this operation is because they have not in their cabinets the proper instruments for this work. Instruments which are ordinarily put upon the market by the supply-houses are not at all suited for this work. They are clumsy and unsatisfactory. I believe, as a general thing, the instruments that are used for cleansing are not delicate nor fine enough. I have here a few selected from my own cabinet which I will present for your inspection. Dr. L. L. Buckland has said that if the mouth be kept as clean as the face it will last as long and look as well. I do not mean to say that I believe all cases of pyorrhœa can be eliminated in this way. I recognize the fact that there are cases de-

pendent upon systemic conditions, but I feel that if our young men were more thoroughly impressed with the necessity of proper and regular cleansing of the teeth of their patients this condition would not develop so frequently.

Dr. George S. Allan.—The question arises, What is pyorrhœa alveolaris? I have never seen a definition that I thought would hold water, and if I am asked the question I have to practically say that I do not know. Of course, the term itself means a flow of pus from the alveolus, but only a minority of the cases that come to us have this flow of pus. Again we have cases where there is pus and no deposit, and again cases where there is neither pus nor deposit, but a loosening of the tooth. A few months ago I made the remark that I believed I could cure as many cases of pyorrhœa as I could of caries of the teeth. I did not think it was any more incurable. I used the term in its generic sense. I do not think I would change that assertion. Regarding the uric acid theory, uric acid is a constituent of the normal urine. It is an element of destructive metabolism. There are cases without number of rheumatism and gout where the urinary analysis shows no uric acid. Again, we have many cases of pyorrhœa where there is no gout in the system. I kept a record of these cases for some time, and I found that those who said they had had rheumatism constituted only about forty per cent. I cannot see why this theory was ever taken up, as there seems to be no substantial basis for it. I have seen patients undergoing a constitutional treatment for months and continually getting worse recover in three or four treatments by instrumentation. The question of removing the tartar is most important. Years ago I read a paper before the New Jersey State Dental Society in which I stated that if a case of pyorrhœa alveolaris develops in your practice it is your fault and not the patient's. The removal of the tartar is a very difficult operation, as can be understood by taking these same teeth out of the mouth and endeavoring to do it. It is surprising what an amount of force is required. Dr. Eames's practical paper has given us a great deal of assistance. The instruments and the syringe are both practical. The syringe is most excellent. His methods are absolutely right. I am very glad to have had the pleasure of listening to him, and hope we may have the pleasure of hearing further from him. There is one point in the treatment which has been overlooked, and that is the bracing of very loose teeth to ad-

jacent teeth. This I have accomplished quite successfully, keeping teeth in the mouth for years that would have otherwise been lost.

I wish to present some instruments for removing tartar. A feature of the instruments is their aluminum handles, insuring lightness.

Dr. Charles O. Kimball.—There is very little I want to say. I want to express, in behalf of the Committee, our very sincere thanks to Dr. Eames for his admirable paper. I cannot say too much for the intense practicality of it. Although he has gone sufficiently into the causes to make this reasonably clear, he has given us specially the practical side of the question. It is just what the Committee hoped he would do. The further discussion has been helpful. May I add one word to emphasize something that Dr. Gillett has said. The cases that are most helpfully treated are not the cases where there is a great mass of tartar. The cases that require our constant watchfulness are the children and the young people, keeping the tartar off by frequent cleansing. My experience has been that this can be done better not with a sharp but with a dull instrument. Now, this may be heretical, but I find that I can feel better with an extremely fine instrument, but one which has had the extreme edge slightly taken off. I can pass the instrument over a tooth and tell better whether I am working at a piece of tartar or a nodule on the tooth. The second thing to emphasize is what Dr. Gillett has said about small instruments. These beautiful instruments which Dr. Allan has shown us are undoubtedly very useful in bad cases, but in the case of a boy or girl where we have simply to remove a slight line under the gum I find I can do it well with but one instrument. An examination instrument with a blade one-eighth inch long and turned at nearly a right angle, about as large as a small cambric needle, flattened and with slightly rounded edges, I can pass under the free edge of the gum and on all sides of a tooth without starting a single drop of blood. Of course, the color of the gum will assist somewhat, but, after all, our main dependence, in my judgment, is in the educated touch.

Dr. R. H. M. Dawbarn.—I rise to ask if any gentleman **here** has used in this suppurative condition what the surgeons are now using a great deal, and that is "glutol"? I think it very well worth trying, especially for cleansing out pockets after the tartar has been removed. Glutol, you will remember, is made by ex-

posing sheets of gelatin to formalin vapor. The formalinized gelatin is then ground down to a fine powder. The solvent action of the living tissue dissolves the gelatin, liberating the formalin, which is the antiseptic factor. This powder is of great value in controlling microbic activity in infected surfaces elsewhere, and should be here, too. It is entirely harmless to the patient, even if swallowed in large amount.

Dr. Eames.—I would like to ask Dr. Dawbarn if there is any reason why it would not be desirable to mix glutol with vaseline and use it in the syringe as suggested?

Dr. Dawbarn.—I can see no reason why it could not be used in this manner.

Dr. Eames.—Mention is occasionally made of serumal deposits on roots of teeth, from which there is no outlet to the margin of the gum. This seems to me to be an unscientific theory, for if this deposit is as irritating to the surrounding tissues as it is generally supposed to be, the resulting products of inflammation must find a way out, and the sinus found if a careful search is made. In regard to the cutting edge of scalers, it seems to me that these edges should be very sharp. This condition necessitates greater delicacy in handling, but the sense of touch should be sufficiently acute to prevent any damage being done by the removal of normal tissue. The advantages of thorough removal and of accomplishing the object with less force are quite apparent.

My feeling in regard to assistants is, that they may be capable of helping very much more than they ever have in the past, and that the patients themselves may do very much more towards the prophylactic home treatment and care of their mouths than they have hitherto done. We have yet to fully appreciate the importance of instructing patients in the care of their mouths and we have yet to learn how much a patient is capable of doing in the care of his own mouth.

I thank you, gentlemen, for your very kind courtesy in listening to me.

Dr. Kimball.—On behalf of the Executive Committee, I move that the thanks of the Institute be extended to Dr. Eames for coming here to-night and giving us this valuable paper. Carried.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

Editorial.

THE CONVENTIONS AT MILWAUKEE.

THERE was no mistake made last year at Old Point Comfort in the selection of Milwaukee as the Western city for the meeting of the several annual conventions. The sentiment was universal among the visitors that this beautiful city by the inland sea was superior to all other places heretofore selected. There was a general feeling of dread, especially by the Eastern contingent, that the torrid heat to which they had been subjected would be more than duplicated in the West, but the continued cool breezes experienced in this city gave renewed life to all, and increased the energy of those engaged in the work of the meetings.

The members of the Association of Dental Faculties and the National Association of Dental Examiners were first on the ground, as both bodies meet in advance of the National Dental Association. These meetings opened on August 2. The writer, not having been present at the sessions of the examiners, is not able to give any idea of the number present or work accomplished.

The Faculties had a delegated representation that covered a wide extent of territory, from New England to California. There were but two colleges in membership, out of the fifty belonging to the Association, that failed to send delegates. A number of the colleges sent alternates.

This meeting was expected to decide the question of increase of time to four years in all the colleges, and the interest in this was necessarily intense, as there was some doubt as to the final result. The resolution making the time in all colleges four years, with a course of six months, offered by Dr. Brown last year, came up in regular order. An amendment was made to this by Dr. Truman increasing the course to seven months. It was soon evident that the contest would not be on the four years, but upon the length of the course. Those favoring six months were earnest in advocating their side of the question, but upon the vote being taken, to the surprise of every one, the amendment was adopted by a large majority. On the final consideration of the original motion

as amended it was not only carried by a large majority, but several colleges changed their negative votes, making it practically a unanimous decision. The fact of the passage of this resolution was at once cabled to Drs. Kirk and Brophy, in attendance at the meeting of the International Committee in session at London.

This increase of time means more for dental education than would appear to those unfamiliar with the work. The vast amount of theoretical and collateral medical training that undergraduates are obliged to undergo has left a minimum amount of time for the important practical work of dentistry. When this rule of four years, with a seven months' course, is fully in force, the fourth year can, and doubtless will, be a year of close attention to practical details. This new law cannot go into effect until 1902-03, as due notice must be given in announcements. It will affect the freshmen of that year, but not those already enrolled in the higher classes. Consequently it will take five years before the colleges can begin to estimate the full effect of this change.

There was, aside from the foregoing, an unusual amount of interesting work accomplished in the Faculties in the direction of progress. There has never been a disposition to excuse the defects in colleges, or their open violations of law, notwithstanding the assertions to the contrary made by those outside of the body and unfamiliar with its methods and practice. Colleges have been repeatedly severely punished for infraction of rules. The committee which has this in charge between the sessions, known as the Ad Interim Committee, has not had heretofore full power to discipline members. A resolution was adopted changing this, giving this committee power to expel, fine, or censure any college violating rules, its decision subject to appeal to the main body. In this connection it may be interesting to our readers to note that two colleges were fined one hundred dollars each at this meeting and one publicly censured.

The question of power to expel a member came up in an unexpected way, and although not decided by the courts, it is established upon a general principle of law that an association of this kind must have a clearly defined standard, and that then the infractions of this must be positively proved before the courts will permit the expulsion of a member where property rights are involved. This was brought unpleasantly to the cognizance of the members by an injunction from one of the courts of Milwaukee restraining

the Faculties Association from all action against the National Dental College of Washington, D. C. This College was placed under discipline upon the report of a committee appointed to visit it last year. The matter came up at Old Point Comfort, but was held under advisement until this meeting. In the mean time another committee visited the school and reaffirmed the decision of the previous committee. The National Dental College in both instances, at Old Point Comfort and Milwaukee, had lawyers sent from Washington to defend its interests. If obstructing action of the Faculties means success, the legal adviser of the National should be well satisfied with the outcome, for he effectually blocked all action by that Association. The Faculties at once retained counsel, but it was found that the courts had adjourned for the summer, and that it would be thirty days before argument could be made to dissolve the temporary injunction. The matter was left in his hands and in the care of a resident member in Milwaukee.

Unless some way is made to overcome this legal obstruction the power of the Faculties will be greatly lessened, but the members of this body are not disposed to have it this way, and measures will be taken that will meet the legal objections.

The National Association of Examiners, not having been served with an injunction, immediately took action against this college and struck its name from the list of recognized schools. This will be, of course, a severe blow to that school, but it invited just such action through its ill-advised procedures. The dentists concerned in educational matters are determined to raise their profession to the highest possible standard, and will not submit with patience to any obstructionists, whether they are to be found among the dental colleges or in the courts.

One of the interesting features of the Faculties' meeting was the appearance of United States Consul J. H. Worman. Our readers are familiar with his name and work in the report which he sent to the State Department at Washington and published in this journal. He has labored persistently for the past eighteen months in Germany to secure evidence against men engaged in the diploma traffic. The evidence thus accumulated, at his own expense, for the government at Washington would not aid directly in this matter, has been of great value, and will be used against these foreign criminals who have invaded our shores to establish

diploma mills for their eager customers in the Old World, for they have none in the New. The Consul's statement was interesting and convincing to the majority of the members, and steps were at once taken to raise a sum of money to meet necessary legal proceedings. To effect this the colleges were subjected to an assessment. The writer, while favoring every effort to bring these people to justice and stop this traffic, was not in favor of permitting the idea to prevail that it was the duty of the Faculties Association to do this work, or that this body had degenerated into a police organization. This organization is educational and can have no other function, and while it may very properly aid in the good work, it has no place, directly or indirectly, in the criminal courts. It is further thought that the United States government could prosecute these cases, for the men thus engaged must have used the United States mails to effect their nefarious purposes. The State authorities of Illinois are in disgrace that they permit this thing to continue with the evidence of criminality clearly established. The people abroad cannot understand anything but a centralized government, and when a State fails in its duty the general government and all the States share in the universal condemnation. The writer learned from reliable sources that active steps will now be taken to bring these diploma manufacturers to justice, but not by the general government or that of the State principally involved, but through individuals. The money for this purpose will be furnished by the Faculties Association and the National Dental Association, and the individual to be the principal actor in the work is one well known to the dental profession, and one who rarely fails in anything he undertakes. There is, therefore, an excellent prospect of the jail population being increased in Chicago; and this may not be confined to the active and open criminals, for there is evidence against others high in authority in the State of Illinois.

The National Dental Association convened on August 6 with a large attendance. The constitutional arrangement requiring all matters of a business nature to be sent to the council enabled the meeting to begin at once the reading of papers and discussions thereon. While there was but little especially new presented in these, there was much that was superior to the average of former meetings. The dental profession is just beginning to see the result of a higher standard of college work in more thoroughly digested scientific essays. The practical man doubtless felt a tinge of dis-

appointment that there was less time given to those subjects that really make dentistry, but this was not wholly neglected.

The discussions upon the several papers were not, as a rule, of a very high order. With one or two exceptions those appointed to open the discussion had not been furnished a duplicate copy of the paper in advance, and were, consequently, placed in the unpleasant position of having but an indefinite idea of the author's meaning. In one instance the entire trend of discussion took a direction entirely opposite from the ideas the essayist intended to convey. This was due to the impossibility of gathering the author's views upon a difficult subject with one hearing. This should not occur in the future, and a duplicate copy should be in the hands of the one to open the discussion some weeks in advance of the meeting.

The National, similarly to the Faculties Association, was enlivened by the presence of United States Consul Worman. His earnest pleadings for a concentrated effort to break up the fraudulent diploma business had a good and immediate effect. A committee was appointed to take the matter into consideration, to report at once. This was done, and the Association appropriated a satisfactory sum to be placed in the treasury subject to the order of the Executive Committee, and to be used to aid in breaking up the traffic in diplomas.

The address of Dr. Black as presiding officer was an able presentation of the needs of the Association. After presenting a brief history of the American and National Associations, he contended that the constitutions of both these organizations had been defective; that upon the disbandment of the American the National took up the work upon practically the same lines, and that these failed to meet present needs. He presented a careful analysis of the constitution governing the National and proposed some radical changes, especially in section work. These suggestions were given into the hands of a special committee. After due consideration, the main features of Dr. Black's amended constitution were reported upon favorably, but the consideration was postponed until the meeting next year. In the mean time the proposed amended constitution will be printed and sent to every member.

While the writer is in full agreement with Dr. Black's modifications, he would have been pleased could a more radical change have been proposed. We need a truly scientific national body. This

was not true of the American nor has it been true of the National Dental Association, and yet there is an ideal standard that the writer can see outlined somewhere in the far-distant future, which is being led up to through the measures proposed. It is probably better to make progress slowly. If the amendments are adopted, they will give increased responsibility to the sections and require increased activity on the part of the chairmen.

The President advocated a change in the time of meeting. This was not inserted in his amended constitution, this being left, as heretofore, in August. It is earnestly hoped that the members will convene next year prepared to change the time to the last of May or beginning of June. Many were deterred this year from attending on account of the great heat, and in every year the Association is deprived of the services of some of its best men for the reason that they feel unwilling to sacrifice the largest portion of the time annually devoted to recreation, and no worker needs this more than the dentist. This August work has generally been a period of torture. This meeting was an exception, and the result of an invigorating atmosphere was apparent in better meetings, more vigorous discussions, and decidedly greater interest manifested by those in attendance. Let us then get away from the heated term.

Much of the success of this meeting was due to the local committee. From the beginning there was no diminution of its efforts to make all retain the pleasantest recollections of Milwaukee. Every day the conveyances were at the doors of the hotel to carry the members and those accompanying them to all parts of interest. Tally-ho rides were daily planned. A steamboat excursion on Lake Michigan was carried out, to the great pleasure of those able to be of the party. The heavy portion of this work fell to the chairman of the local committee, Dr. G. V. I. Brown, and nothing was left undone on his part to make the meetings at Milwaukee memorable and unique in the history of dental conventions.

This brief report of the work of the dental conventions cannot be closed without an allusion to the very full exhibits made by manufacturers of dental supplies. This in itself was an object-lesson. The writer was greatly impressed with it as an evidence of the progress made in dental appliances and in dental therapeutics. It seemed to accentuate more than ever the growing appreciation of dental work and dental knowledge.

The Convention had the pleasure of listening to a report of the work of the Army Examining Board from Dr. J. S. Marshall, its president. The board has, for the present, concluded its labors, although the full number of contract surgeons permitted by the bill has not been completed. Dr. Marshall has been assigned to the Presidio, California, Dr. Oliver to the Philippines, and Dr. Morgan to Cuba.

The S. S. White Dental Manufacturing Company had on exhibition the outfit given to each of the successful candidates. It is very compact and well suited for ready transportation. The chair is of light material, easily folded up, but yet quite strong and well adapted to the work. With such a complete outfit, in many respects superior to that obtainable by any young practitioner, the young army contract surgeons should be able to make a creditable showing the coming year and justify the assertions of those who advocated this measure that it was in the interest of the army that the bill should become a law, and not primarily to afford places for needy young practitioners.

Thus closed the conventions of the year 1901, and if their success is to be the gauge of progress for the future, the years yet to be are full of promise for the advancement of dentistry to a still more honorable position than it has heretofore occupied among the active professional organizations of the world.

Bibliography.

ANNUAL AND ANALYTICAL CYCLOPÆDIA OF PRACTICAL MEDICINE.

By Charles E. de M. Sajous, M.D., and One Hundred Associated Editors, assisted by Corresponding Editors, Collaborators, and Correspondents. Illustrated with Chromo-Lithographs, Engravings, and Maps. Vol. VI. F. A. Davis Company, Publishers, Philadelphia, New York, Chicago, 1901.

The editor says in his preface that "This volume is the last of the first series of the present work. . . . The work presents all the general diseases usually described in text-books, and besides what progressive features the past decade has furnished."

The very carefully prepared index gives a better idea of the magnitude of this entire work than even an examination of the six volumes could give, entering, as it does, into the minutiae of the work, which the general reader will probably fail to do.

In the various reviews made of previous volumes of this series there could be but one favorable opinion expressed as each appeared. The present volume is large, one thousand and forty-three pages, including index, which covers one hundred and eight pages of double columns. In it are presented a series of valuable articles, equal, if not superior, to those that have preceded in previous volumes. Among these are "Rheumatism," by Dr. Levison, of Copenhagen; "Diseases of the Stomach," by Professor D. D. Stewart, of Philadelphia; "Surgery of the Stomach and Intestines," by Professor W. W. Keen and Dr. M. B. Tinker, of Philadelphia; "Surgery of the Spine," by Professor R. H. Sayre, of New York; "Syphilis," by Professor G. F. Lydston, of Chicago, etc.

There is nothing said in the prefatory notice in regard to a future edition except the expression "last of the first series," but it is presumed the subject matter will be added to from time to time and that which has become obsolete will be eliminated. The work as it stands now seems to the reviewer not only to cover the entire domain of medicine, but it does that so thoroughly that, if kept up to its present standard, it must be not only a reference work in the library, but an authority upon questions of pathology and therapeutics. The various writers have entered upon the discussion of diseases with a fulness not often met with in ordinary text-books, hence the special value of this cyclopædia. It has been an herculean task to prepare these volumes, and the scholarly editor and his assistants may be congratulated upon the successful completion of their work.

Domestic Correspondence.

THE ARMY DENTAL EXAMINING BOARD.

TO THE EDITOR:

SIR,—The general impression among certain members of the dental profession regarding the personnel of the Army Examining Board is far from a favorable one. The journals over the country have all had something to remark regarding this board, its proficiency in a professional way, and its competency as an examining board. One of these very prominent journals went so far as to say that there was one well-known man on this board, insinuating that perhaps there was only one competent man there.

That which I have to write regarding this board is purely the promptings of gratitude and with the hope of correcting some erroneous impressions. While I realize that the gentlemen comprising this board do not desire any public mention in this direction, I trust that my remarks will not be regarded as ill-timed. It is known that quite a number of applicants have gone before this board and failed to pass what was then termed an unfair examination. Some of these have informed me that the subjects dealt with were obscure and the questions unfair. I wish to give my testimony in this matter, and that I have been before this board and virtually failed to pass, or rather was compelled to withdraw on account of sickness. I can clearly remember the kindness with which the members dealt with an applicant. They do not occupy an enviable position by any means, and while they do not offer to teach a candidate, as some seem to think they should, they still use every fair and honest means available to bring out what man has in him. The one characteristic feature of this board is its profound respect for a professional gentleman. One is treated simply as an equal; and though some of the candidates fail to appreciate this fact, and take advantage of the courtesies shown them, the members of the board never allow one to lose sight of the fact that they are doing their duty and are not there for the purpose of frightening a man out of what he knows. The examination is rigid, and it certainly should be so, but as to the questions being unfair or obscure, there is positively no such thing existing.

Among a select few who have failed this report of unfairness and incompetence has arisen, and some of these individuals are sure to meet a new candidate and give him false impressions regarding the examination and the men who are holding it.

I believe it is due the board that these reports be met, at least, with the truth from some source. These gentlemen have paid little or no attention to these unkind rumors, and some of them are very unkind indeed, being of a purely personal nature and questioning the honesty and competency of them as a board.

The general impression that political pull is all that is necessary to enable one to pass is certainly a most unjust assertion, as I know that it avails but little. As a whole, I never saw a more perfect organization than this board of three. I never saw gentlemen so harmoniously laboring, and I believe that they give a candidate credit for everything he knows, and I certainly know that the marks are generous. They take nothing for granted.

In conclusion, I desire to say that personally the Army Board of Dental Examiners has my lasting gratitude for the courtesy extended me, and as a board I pay tribute to their fairness, honesty, competency, and professional dealing with professional gentlemen.

K. J. SCHUMANN.

ATHENS, TENN.

Foreign Correspondence.

AN OPEN LETTER.

EXTRACTS from a postscript to a letter of April 12, 1900, to Dr. W. C. Barrett, chairman of the Foreign Relations Committee of the National Association of Dental Faculties.

PARIS, May 20, 1901.

DEAR DOCTOR,—As you did me the compliment to invite my personal opinion on professional matters, I have delayed sending the above letter of April 12, always hoping to be able to add a few impressions.

As I understand the matter, the main object of these foreign

boards is to help insure that the D.D.S. degree carries with it a guarantee of professional respectability so far as preparation and course of study is concerned, and, supposing that to be established, I have noticed a great tendency on the part of members of these boards to insist that respectability of the degree ought to carry with it the right to practise anywhere. This, if theoretically true, would never be admitted abroad, and actually is not admitted even at home.

Your circular of December 10, 1900, I most heartily approve, as it clearly limits the power of the boards. A little power is a dangerous thing in the hands of some people, and especially to those unaccustomed to it, and the real object—the general good—may be forgotten in the opportunity to protect private and personal aims.

In general a board which cannot, on account of the personal elements composing it, command at least respect in the country in which it is located cannot be efficient in smoothing out the prejudices against our degrees, but, on the contrary, being itself discredited, throws also discredit upon the institution which it is supposed to represent, as well as upon the products of these institutions.

Nothing tends more to place a board in discredit than the attempt to influence the laws of the country in its own favor. In each country the American dentist finds opposition and difficulties peculiar to it, and in meeting these many personal elements arise which are too apt to influence the action and attitude of the board.

It may be gratifying to a man who finds himself rather isolated in a foreign country and pressed by hostile competitors, to be able to show that he is backed by the whole dental educational system of America, through being a member of the Advisory Board of the Foreign Relations Committee of the National Association of Dental Faculties of the United States of America, and he can drop a hint to that effect, and of vague possibilities of evoking retaliatory measures.

Some of the boards have done good work in the way of showing up bogus diplomas and bogus institutions, but for Heaven's sake "save us from our friends" if we must continue to read these exposures. We have had enough. These things are exploited to our discredit by men who know better. The doings of an admitted bogus institution are made to apply to all our colleges, before legislators

and before the public, just as the "Buchanan" affair was made use of by the Doyen (Dr. Bronardel) of the Faculty of Medicine before the Parliamentary Committee when the French Medical and Dental Law of 1892 was being passed, to throw discredit upon all our professional schools.

It is not the *whole* truth some of these foreigners want, it is part of the truth,—just enough to use against us. This is a regular plan, a part of a propaganda to discredit the American dental degree, and why? Because its superiority and value is fully recognized in Europe, to the detriment (they consider) of native talent, and so much so that (while almost no American advertises in Europe) every quack and advertiser of Europe pretends to be American or advertises to practise the American system; and it is this well-recognized superiority of the dentist educated in America that has led unscrupulous men to exploit this good name and reputation for base purposes.

It is well to know one's own faults and weaknesses, but we had better stop advertising them and spend our efforts in correcting them and living them down.

Let foreign governments hunt up their own bogus doctors, and let the American dental colleges give attention to their own standards.

I fear that the giving of these foreign boards an official character is, after all, a mistake, and likely to do more harm than good.

Yours very sincerely,

I. B. DAVENPORT.

Obituary.

DR. H. J. McKELLOPS.

IN the death of Dr. H. J. McKellops, on April 23, 1901, St. Louis has lost the last of her pioneers in the profession of dentistry.

Dr. McKellops began the practice of the profession when scarcely half a dozen dentists had offices in St. Louis, his colleagues then being such men as Isaiah Forbes, Aaron Blake, Isaac

Comstock, J. L. Clark, C. W. Spalding, and H. E. Peebles. All of these had passed away when death closed the career of Dr. McKellops. He had been for fifty-six years an active practitioner. In that time his reputation had extended over the United States, he had contributed much to the material advancement of the profession of dentistry, and, more than any one else in the city, perhaps, had been instrumental in bringing to it the prestige it enjoys as one of the learned professions.

Dr. McKellops was born at Saline, near Syracuse, N. Y., on August 31, 1823. His father, James McKellops, died before his son had entered his teens. In 1840 he came to St. Louis with his mother and sister, entering one of the public schools. Active and intelligent, he soon after obtained appointment as a messenger in the Missouri Legislature, using the money thus earned for tuition at the University of Missouri, at Columbia, where he studied from 1842 to 1844. A course of book-keeping in Jones's Commercial College followed this schooling, after which he found employment in the City Register's office, where opportunity presented for forming a wide circle of acquaintances, valuable afterwards when he entered the practice of dentistry.

He was drawn to the study of medicine in 1846 and 1847, at the old St. Louis Medical College, of which Dr. Charles A. Pope was Dean. For the next six years he attended many of the lectures, but never took the degree of M.D.

Through the persuasion of his brother-in-law, Dr. George Silvers, a dentist, he was drawn from medicine to the practice of dentistry. Natural ingenuity and a love of the mechanical arts soon made him an expert operator, and soon after opening his first office he commanded a practice of the highest class.

In 1855 the degree of D.D.S. was conferred on him by the Ohio College of Dental Surgery, in recognition of his skill and services to the profession, his fame already having extended through Missouri, and eventually through all the States of the Union. Dr. McKellops introduced in St. Louis the use of continuous gum work, invented by Dr. John Allen, of New York. In his profession he was studious, inventive in practice, and always to the front in every step of progress in dental surgery.

A loving-cup was left by him on which appears the following: "Presented to Dr. H. J. McKellops by the First Dental Society of the State of New York, as an expression of the high esteem and as a

token of its appreciation of the inestimable services rendered by him as Supervisor of Clinics at the Annual Meetings, New York City, January 21, 1891."

The St. Louis Dental Society, on March 24, 1900, tendered Dr. McKellops a banquet as a token of esteem and love.

Personally Dr. McKellops was a man of high ideals, sociable and warm-hearted. His sociability found expression in the field of his profession, in the organization of dental societies and associations, in the proceedings of which he always took a leading part. He was one of the organizers of the St. Louis Dental Society, founded on December 9, 1856, and in 1879 served as its president. He helped organize also the Western Dental Association in 1860, was first president of the Missouri State Dental Association in 1865, served as president of the American Dental Association in 1878, and in 1884 was elected president of the Southern Dental Association.

In social life, no less than in his profession, Dr. McKellops was popular, and he was a particularly welcome guest at social gatherings, because of his high intelligence and brilliant powers of entertaining.

The observations of the necessity of dentists in the army no doubt prompted Dr. McKellops to introduce a resolution at a meeting of the Western Dental Society, held in Quincy, Ill., on July 21, 1858, to the effect that a committee be appointed to memorialize Congress on the necessity of appointing dentists to be attached to the regular army. The resolution was adopted, and a similar resolution was passed by the American Dental Convention in August the same year, being introduced by Dr. McKellops.

Dr. McKellops married Miss Annie Gower, of Tennessee, on April 1, 1849. Eight children were born,—five sons and three daughters. Those now living are Dr. Henry L. McKellops and Mrs. Josephine Bouvier, of San Francisco, Linton J. McKellops and Dr. Leo C. McKellops, of St. Louis, and Gerald G. McKellops, of Cincinnati.

JOHN G. HARPER,
BURTON L. THORPE,
EDWARD H. ANGLE,
Committee.

Miscellany.

TO REPAIR BROKEN PLASTER MODELS.—To repair broken models, use Diamond Magic Invisible Cement, put up in small vials by the Diamond Ink Manufacturing Company, Milwaukee, Wis. It is a clear liquid, and models may be repaired so that the break will hardly be visible. Broken impressions may be put together in the same way. The cement thickens with age and exposure, and I know of no way to thin it, but it costs only ten cents a bottle, which is enough to repair two or three hundred models, so that it is a small item. Models repaired in this way will stand the pressure of closing the flask and vulcanizing very nicely.—F. H. ROBERTS, *Dental Brief*.

[The writer has repaired models with a thickly mixed oxy-phosphate cement, which has answered every purpose.]

PYORRHŒA ALVEOLARIS IN DOGS.—My attention has been called to one or two dogs lately, highly domesticated dogs that live in the house and sleep on a rug, which are losing their teeth from pyorrhœa. They eat a good deal of cake and candy and such things. The canine family, as a rule, usually have pretty good teeth, but I speak particularly of the highly domesticated dog. In one of the dogs of which I speak the central incisors have been lost by the disease. These dogs, as I say, live very largely on sweetmeats.—DR. J. G. REID, *Western Dental Journal*.

THE USE OF LOGAN CROWNS AS PIERS IN BRIDGE-WORK.—Dr. A. E. Peck, at the Annual Meeting of the Minnesota State Dental Society, gave a bench clinic in which he demonstrated the use of the Logan crown as a pier in bridge-work. The root and cap were prepared after the same manner as for a Richmond crown. He then punched a hole for the reception of the pier. A piece of pure gold was placed between the porcelain and the cap to obtain perfect adaptation. A piece of pure gold, 32-gauge, was then burnished on the back of the Logan crown, extending to the gold band which formed a backing for the same.—*Dental Review*.

FETID BREATH.—Professor B. Fränkel (*Archiv. für Laryngol.*) offers some remarks upon the subject of disagreeable odors arising from the mouth and other parts of the respiratory tract. In order to determine definitely whether the odor arises from the nose or the mouth, a piece of card-board of suitable dimensions is held against the upper lip beneath the nose, and the patient, with the mouth closed, blows first through one nostril and then through the other. The observer sits with his nose at the opposite end of the card-board, and may in this way determine whether one or both nostrils afford the source of the odor. Then, with the nostrils closed, the patient is allowed to breathe through the mouth. If one has determined that the odor arises from the mouth, it is necessary to further decide whether any particular portion of the mouth or pharynx is responsible for the odor. To accomplish this, Fränkel collects the secretion on a cotton applicator from each suspected spot, and subjects it to his olfactory judgment.

If carious teeth are responsible for the fetor, the dentist can remove the odor completely. He finds the tonsils frequently the seat of the odor, due to decomposition of their secretion or caseous abscesses in the tonsils. Where the secretions of the entire mucous membrane have undergone fetid decomposition, or where the disagreeable odor arises from the lower respiratory tract or the œsophagus, the prospect of treatment is not good. In any case, he recommends a bactericidal and deodorizing mouth-wash.—*Dental Digest*.

Current News.

TEXAS STATE DENTAL ASSOCIATION.

THE Texas State Dental Association met at Sherman, May 14, 15, and 16, 1901, with a good attendance, and a splendid meeting resulted. Waco was selected as the place for the next meeting, 1902. The following officers were elected:

President, Dr. H. L. Pearson, McKinney; First Vice-President, Dr. J. G. Fife, Dallas; Second Vice-President, Dr. Thomas P. Williams, Houston; Secretary and Treasurer, Dr. Bush Jones, Dallas; Curator of Museum, Dr. A. F. Sontag, Waco.

Executive Committee.—Dr. Sam G. Duff, Chairman, Greenville; Dr. E. F. Comegys, Gainesville; Dr. W. R. Rathbone, Cuero.

BUSH JONES,
Secretary.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

At the annual meeting of the Central Dental Association of Northern New Jersey, held on the evening of February 18, 1901, the election resulted as follows: President, Frank G. Gregory, Newark; Vice-President, J. W. Fisher, East Orange; Secretary, Frederick W. Stevens, Newark; Treasurer, Charles A. Meeker, Newark.

FREDERICK W. STEVENS,
Secretary.

ILLINOIS STATE DENTAL SOCIETY.

FOLLOWING is a list of officers and committees elected for the ensuing year at the last annual meeting of the Illinois State Dental Society:

President, M. L. Hanaford, Rockford; Vice-President, J. E. Hinkins, Chicago; Secretary, A. H. Peck, 92 State Street, Chicago; Treasurer, C. N. Johnson, Chicago; Librarian, J. T. Cummins, Metropolis City.

Executive Council.—J. R. Rayburn, Fairbury; W. E. Holland, Jerseyville; J. G. Reid, Chicago.

Executive Committee.—J. W. Cormany, Mt. Carroll.

Publication Committee.—A. H. Peck, C. N. Johnson, Edmond Noyes, all of Chicago.

Board of Examiners.—Edmond Noyes, Chicago, to succeed C. M. Robbins, term expired.

Committee on Dental Science and Literature.—G. V. Black, Chicago.

Committee on Dental Art and Invention.—H. J. Goslee, Chicago.

Committee on Infraction of Code of Ethics.—T. L. Gilmer, Chicago; A. S. Waltz, Decatur; O. L. Frazee, Springfield.

Supervisor of Clinics.—D. M. Gallie, Chicago.

Committee on Local Arrangements.—O. L. Frazee, Chairman; E. F. Hazell, T. P. Donelan, Assistants, all of Springfield.

A. H. PECK,

Secretary.

ANNUAL MEETING OF THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

THE next annual meeting of the Mississippi Valley Medical Association, under the presidency of Dr. A. H. Cordier, of Kansas City, bids fair to eclipse all previous ones in attendance as well as scientific merit, as the following preliminary programme will show.

Unusual railroad rates have been obtained for this meeting: a one-fare rate by way of Cleveland, which will enable those taking advantage of these rates to obtain an extension of tickets to October 8 for attendance upon the Buffalo Exposition; a one-and-a-third-fare rate on the certificate plan will be in effect *via* Detroit, Sandusky, and Toledo, with extension of return limit for only three days after the meeting.

Put-in-Bay is an ideal place of meeting, the Hotel Victory a magnificent meeting site.

The address in Medicine will be made by Dr. Frank Billings, of Chicago; the address in Surgery by Dr. Reginald Sayre, of New York City. The Association is to be congratulated on the selection of these two orators, who will acquit themselves in a most scholarly manner.

The annual banquet will be held on the evening of the first day, September 12; on the second, the evening will be given up to the reading of several papers with stereopticon exhibits and demonstrations, the President's address and the annual orations being delivered on the three mornings of the meeting.

The profession is cordially invited to attend this meeting.

No title can be received after August 20 for publication on the final programme.

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Original Communications.¹

ELECTRICITY AS APPLIED TO CHEMICAL AND METALLURGICAL PROCESSES.²

BY J. CONARD WATKINS, D.D.S., WINSTON-SALEM, N. C.

MR. PRESIDENT AND MEMBERS OF THE NORTH CAROLINA STATE DENTAL SOCIETY,—Chemistry and metallurgy of to-day are very little like they were a few years ago. We look with ridicule and pity at the efforts of the alchemists as they tried to turn mercury into gold, forgetting that our own chemists wrought infinitely greater magic when they discovered the process whereby at will they could extract from foul, filthy coal-tar all the colors of the rainbow and all the sweet perfumes of Arabia. Chemistry of to-day has gone forth into the highways and hedges of industry and commerce working magic all along its course. There is no art and no manufacture, however insignificant, that has not come under its beneficent influence to a greater or less extent.

One of the most important factors in bringing about these great improvements is the marvellous development of electricity. We are now familiar with the telegraph, the telephone, the electric

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the North Carolina Dental Association, June 26 to 28, 1901.

railway and automobile, the X-ray apparatus, the electric light, the new system of wireless telegraphy, and many other kinds of electrical appliances.

We think it would not be inappropriate to speak of electricity as applied to chemical and metallurgical processes. In doing this, we will mention a few of these practical changes which are likely to prove of interest as well as of great importance in our profession.

Most of the very little that has actually been accomplished in electro-chemistry has been done by use of electrolysis and electro-synthesis. We will describe the preparation of one of our important dental medicines that is prepared by these methods, which will give us a practical idea of the *modus operandi*.

iodoform.

Ethyl alcohol in an alkaline iodide solution by the aid of electrolysis gives us iodoform, which is represented in the following equation:



This electrolysis is best performed with ten to fifteen grammes calcined soda and ten grammes potassium iodide in one hundred cubic centimetres of water and twenty cubic centimetres of alcohol, which are placed in a porous earthen cylinder with a platinum anode. The cathode, of nickel, is surrounded by a strong solution of sodium hydroxide. A temperature of 70° C. is required with a current density at the anode of one ampere per one hundred square centimetres, and is continued for from two to four hours. After standing for several hours iodoform crystallizes from the solution. Sodium iodide remains in the mother liquor as the principal secondary product.

ALUMINUM.

Thirty-eight years ago aluminum was a chemical curiosity. Through the efforts of Deville it first acquired a commercial character, and its extraction became a metallurgical process. But now the development of electrometallurgy has enabled us to produce aluminum economically.

In 1889 the aluminum produced in this country was mainly obtained from Greenland cryolite. The Pittsburg Reduction Company in this country carries on the extraction of aluminum from its

oxide, alumina, by means of electrolysis. The principle is that the alumina is decomposed in the presence of a melted fluoride by the electric current, and metallic aluminum is liberated.

The furnace used in the extraction of aluminum is an open, iron-cased box, which is thickly lined with carbon and is provided with a spout at the bottom for "tapping off" the aluminum. The alumina is dissolved in the "fused flux," consisting of fluorides of aluminum and sodium, which serves as a vehicle for the alumina. A large block, or series of bars, of carbon, carried on an adjustable support and arranged to dip into the centre of the furnace, forms the anode, the furnace itself forming the cathode. After the flux and alumina are introduced, the carbon anode is brought well down into the furnace and the current is turned on. Considerable resistance is at first offered, but as the materials in the furnace become highly heated this decreases, and the anode can be raised slightly.

Decomposition soon begins, and the oxygen is liberated at the anode, where it unites with carbon, forming carbon dioxide, which passes off, while the aluminum remains. The metallic aluminum is heavier than the melted bath, and as it sinks to the bottom it is "tapped off" from time to time, while fresh alumina is added.

The uses of aluminum are varied and without end. It is used for drinking-utensils, smokers' sets, watch-cases, umbrella-handles, billiard-cues, and an endless variety of souvenirs.

Then, again, we have often seen references in the newspapers to the Swiss steam-launch of aluminum. As early as 1891 an aluminum life-boat was constructed in Prussia. In the German army aluminum canteens and military equipments are used. We are also familiar with the many dental uses of aluminum, the more important of which are for impression-trays, air-chambers, aluminum combination dentures and plates. In operative dentistry we meet with aluminum crowns and bridges.

Aluminum is a splendid conductor of electricity and is now largely used in electrical appliances. The hardness of aluminum varies according to its purity, the purest being the softest. Like gold, it hardens on being worked, and annealing makes it very soft. In hardness aluminum stands next to gold.

In ductility aluminum ranks sixth among the metals. Aluminum is very malleable, standing second only to gold. Aluminum can be rolled into sheets of only from five to seven ten-thousandths

of an inch in thickness, and such sheets can be beaten into leaf nearly as thin as any gold-leaf. This aluminum-leaf is largely used in decorative work, and is it not possible that it can, some day, be substituted for gold-foil in operative dentistry?

For a long time it was thought that aluminum could not be soldered, and for this reason its practical use was somewhat retarded. We know that chloride of silver will act as a solder for aluminum, and the Pittsburg Reduction Company claims that there are preparations that will nicely solder aluminum. If this be true, may we not predict that in the near future we will see a great many aluminum dentures?

CARBORUNDUM.

Ten years ago Mr. Edward G. Acheson, of Monongahela City, Pa., in the face of many obstacles, carried to commercial success his invention of carborundum. Within these few years carborundum has rapidly risen, until it stands in the front rank of abrasives.

Many of us in the preparation of teeth for crown- and bridge-work, as well as in prosthetic dentistry, use carborundum with a great degree of satisfaction, for we can with it cut much faster than with the other abrasives.

At first there was some hesitation on the part of the profession in adopting carborundum. Among other objections was the fact that it was very expensive; but now, the time saved and the lessening of "torture" to the patient (and those who have had live teeth prepared for a crown know that it is torture) give it a fixed place in dentistry.

This new material stands next to diamond, not only in composition, but in its internal and external properties. Its crystals are wonderfully brilliant, and its extreme hardness makes it an efficient and powerful abrasive material.

This wonderful product is obtained by heating a mixture of one hundred parts sand, twenty-five parts salt, and twenty-five parts coke in an electric furnace. It has been found that the addition of sawdust to the mixture renders it porous, which allows the gas to escape. The output of the first furnaces was one-quarter of a pound of carborundum a day; now a single furnace yield is about seven thousand pounds of crystalline carborundum.

From time to time improvements in the furnaces have been made, until to-day the works at Niagara Falls under the direction

of Mr. Acheson have gigantic furnaces, of which we will speak later.

We now turn our attention to the manufacture of carborundum. The crude materials are received in the stock building, and, with the exception of the coke, are ready for immediate use.

The coke is passed through a grinder and carried to the top of the building, where it is poured through successive screens, from which the powder is passed on for the mixture, while the kernels of a certain size are landed into the core-bin and are used in making the core.

The sand, coke, sawdust, and salt are conveniently conveyed into the scales, from which they are elevated to the mechanical mixer. All the work of preparing this mixture is so systematized and mechanically done that it requires the labor of *only two* men.

The furnaces, of which there are fourteen, are built of brick in the form of an oblong box, the approximate interior dimensions being sixteen feet in length, five feet in width, and five feet high. The ends of the furnace are the only permanent part, as the remainder is built up each time the furnace is used. The ends are about two feet thick, and through their centres pass the terminals, which consist of sixty carbon rods thirty inches long and three inches in diameter. "The outer ends of the carbons are enclosed in a square iron frame, to which is screwed a stout plate bored with sixty holes, corresponding to the ends of the carbons. Through each of these holes is passed a short piece of three-eighths-inch copper rod, fitting tightly a hole drilled in the carbon.

"Finally all the carbons are tightly packed with graphite. Each plate is provided with four projections, to which the cables conveying the current may be bolted."

We now look at the furnace proper. The side-walls are built up about four feet. Pieces of sheet-iron are so placed as to keep the mixture four inches from the inner ends of the carbon terminals. The furnace is then filled about half full of the mixture. Between the ends a semicircular trench with a radius of about ten and one-half inches is made into which the proper amount of the carbon kernels is placed, and they are rounded with the hand to form a cylinder twenty-one inches in diameter.

Between the terminals and sheet-irons finely ground coke is packed and the sheet-irons are then removed, which completes the connection. The walls of the furnace are built up about five feet

in height, and the mixture is heaped on until it rises to about eight feet, when you are ready for the electric current.

The Niagara Falls Power Company furnishes power that has an electro-motive force of two thousand two hundred volts, but as this is too high for use in the furnace, it is reduced in a transformer that has a maximum capacity of eleven hundred horse-power, and reduces the two thousand two hundred volt current into one of only one hundred and eighty-five volts. The circuit is completed and is regulated by a volt-metre and an am-metre. Of course, the resistance of the core is very great at first, but after a while it becomes sufficiently low to allow one thousand horse-power to be steadily employed.

After the circuit has been on about half an hour we notice the peculiar odor of escaping gas. After three or four hours the sides and top of the furnace are completely enveloped by a lambent blue flame, which is that of carbon monoxide. At the end of about thirty-six hours the current is cut off and the furnace allowed to cool for a few hours. After taking down the side walls and removing the unchanged mixture we reach the outer crust of amorphous carborundum. This is easily removed with large steel bars, and can readily be separated from the inner crust of amorphous carborundum, which is removed with a spade, and we now find *carborundum crystals*. The carborundum is then taken to the crusher, where large rollers break apart the mass of crystals. These crystals are then taken to large wooden tanks, where for several days they are treated with dilute sulphuric acid to remove impurities. They are then thoroughly washed, dried, and passed through screens which grade them from No. 8 to No. 220.

Care is used that "nothing be lost," and the water that washes the crystals is passed through a series of tanks, where the fine powder, "flowers," is obtained. This is graded F, FF, and FFF.

The vitrified process is used for forming the carborundum crystals into wheels. The carborundum is mixed with a certain proportion of kaolin and feldspar, and after the mixture is placed into a mould hydraulic pressure is applied.

The vitrification of the wheels is carried out in kilns similar to those used in baking porcelain. The operation of firing lasts about seven days, after which the wheels are "turned up," tested, and then they are ready for the market.

Carborundum costs from two to five times as much as emery,

but in tests with emery it has been proved that the same results can be obtained at less expense with carborundum than with emery.

The uses of carborundum are varied, and we will only mention a few. Carborundum is used in the manufacture of steel as a substitute for ferro-silicon; it is also used by the watchmaker, the roll-grinder, the pearl-grinder, and, in fact, wherever an abrasive is required.

Already the carborundum companies are prepared to furnish eighty thousand different wheels, not including dental wheels and other specialties.

Before concluding we must mention some of the leading characteristics of carborundum. In hardness it is between nine and ten degrees,—*nearer* ten,—which is the hardness of diamond. It cuts emery or corundum with ease. It is not as tough as diamond, but is brittle, closely resembling corundum. It is infusible in the highest attainable heat. Carborundum is insoluble in all the ordinary solvents. Acids, oils, water, and not even hydrofluoric acid will dissolve it.

It is composed of silicon and carbon in equal atomic proportions, and its chemical formula is SiC .

The color of pure carborundum is white. In commerce we meet many colors and shades, the prevailing colors being blue, green, and black; these are partly the result of impurities and partly owing to the surface oxidation, but this has no effect whatever upon its hardness.

Chemistry and metallurgy by the means of electricity during the last ten years have brought us so many new and important products, that after a thoughtful consideration of the remarkable achievements of the past century it might seem to the laity that the limit of scientific research had almost been reached. But the thinking man knows that this work is not done; in fact, it is but commenced. There is an infinity of problems *yet* to be solved, and let *us* await with eager anticipation, ever ready to accept what the twentieth century may unfold.

PERIODS OF STRESS AND THEIR DENTAL MARKS.¹BY JAMES G. KIERNAN, M.D.²

DESPITE embryologic teachings, the old notion that man alone is an entity who undergoes development still controls pathology and physiology. The human being, however, is a compound animal, in whom organs have their own nervous system and their own life under control of the cerebral spinal system. Vertebrate embryos are of common type at their origin, and assume successively many common forms before definitely differentiating. The higher vertebrates contain in essence the organs and possibilities of all lower vertebrates. The human organism is, therefore, a balance. While the balance is maintained the organs work in unity, though there is a constant struggle for existence between them. During embryonic existence this struggle is more intense and diversified than after maturity because of the influence of three contending forces,—remote atavism, or retrogression to primitive types; immediate atavism, or retrogression to less remote ancestors of the same type; and, finally, immediate heredity. Remote atavism tends to preserve structures which occur in the normal embryo only to disappear. The human heart passes through all vertebrate heart phases. This is likewise true of the teeth. During the life of the embryo the tooth system wavers at one time between the polyphyodont and the diphyodont. At this period, should the diphyodont tendency of man be arrested, the polyphyodont takes its place and the human being sheds teeth as do reptiles. On the other hand, should immediate atavism gain the ascendancy over remote atavism, as shown in polyphyodontia, diphyodontia occurs. When the struggle for existence between the two is keenest, a period of stress results which affects the organism as a whole. This stress expresses itself most strongly in dental and maxillary irregularities, since the jaws and teeth are among the most variable structures in evolution. Under what is known as the law of economy of growth is governed the relation of the organs to each other and the process whereby one structure is sacrificed for the development of another or for the

¹ Abstract of a paper read before the Section on Stomatology, American Medical Association, June, 1901.

² Fellow of the Chicago Academy of Medicine; Foreign Associate Member French Medico-Psychological Association.

development of the organism as a whole. Since certain parts in the evolution of organs disappear, and in the evolution of organisms certain organs through suppressive economy, and since the disappearing and developing tendency of necessity centres around the time when certain functions are to be lost by the disappearing, and others gained by the developing, periods of stress occur around which the law of economy of growth centres the struggle for existence between parts of organs and between organs themselves. It is because of this that physiologic atrophies and hypertrophies and their reverse occur. Nearly all conditions of physiologic disturbance may result at these periods of stress from the influence of maternal nutrition or environment or of hereditary factors. The foetus, therefore, must be prepared to pass through not only intra-uterine periods of stress whose dental mark has already been indicated, but post-uterine periods as well.

The child has not attained its full development at the time of birth. It has within it certain potentialities, some of which are never fully realized. Man is an imperfectly developed child. There is a constant struggle between the central nervous system and certain bodily functions for preservation of the individual and some for preservation of the race, through which the central nervous system fails to reach the height indicated in the child. This struggle for existence after birth is keenest at certain periods. Each period is marked by dental phenomena. The first is the period of the first dentition. Here, coincident with teething, the child is gaining its impressions of the outside world, is learning to walk and talk, and is also developing its eliminative organs, especially the rectum. These varied functions constitute a strain on the system the effects of which are most often evinced through the teeth and jaws. The conditions charged to teething are an expression of constitutional strain finding its outlet through the point of least resistance. During this first dentition the strain of development forces attention to the teeth and thereby leads to neglect of other factors. The teeth at this period should be regarded as a meter of constitutional strain and not a cause of it. Within the next period, between two and six, occurs the first great check to continued development of the brain. Man has learned to use his brain despite this check, but had it not occurred he would have had a higher type of brain to use. Sometimes during this period the brain gains in size, albeit not in balance, at the expense of the general system. In no small degree the struggle for

existence during this period of stress centres around the development and eruption of the sixth-year molar. With the eruption of this molar, premature puberty, sexual precocity, epilepsy, insanity, gout, rheumatism, obesity, and other nutritive degeneracies may occur. All have been charged to the eruption of the sixth-year molar, whereas its irregular or difficult eruption is like them, an expression of constitutional stress. Hygiene of the teeth at this period means also constitutional, mental, and moral hygiene. Epilepsy, for example, is not a disease, but a symptom of weakness of certain vasomotor inhibitions. The first convulsion does not constitute epilepsy. Through a law of the nervous system, nerve action, once roused, tends to repeat itself. In this way are established normal and abnormal habits, of which last epilepsy is one. In its early stages a habit, normal or abnormal, is easily checked. The first convulsion, therefore, could be prevented were its premonitions known. A recurrence could also be prevented were the constitutional origin recognized. Observation of the general constitution at this time because of irregular eruption of the sixth-year molar would enable the physician to nip epilepsy and many allied conditions in the bud. Reflex notions, however, must be flung overboard. All irritations should be removed and any constitutional irregularity treated.

The obese child of six years, even though the obesity be not excessive, should be looked upon from a health stand-point with suspicion. There is liability to disease and marked tendency to systemic weakness when under morbid influence. These children are particularly liable to rheumatism, gout, etc., and profuse hemorrhage from slight causes. Youthful obesity is sometimes associated with precocious maturity and resultant early senescence. More often it coexists with extended infantilism, as in the case of Dickens's "fat boy."

E. S. Talbot, examining two hundred and sixty-seven corpulent school-children and adolescents, found marked stigmata of degeneracy. Ninety-two per cent. had deformed ears to a marked degree. Sixty-six per cent. had arrested development, as compared with their age, while twelve per cent. presented excessive development. Thirty-four were too young to determine the form and size of the jaw. In thirty-three and a half per cent. of the thirty-four the molars, incisors, cuspids, and bicuspid were present. Ninety-six per cent. of these had small teeth. Eighty-seven per cent. (of the

two hundred and thirty-three) had arrested development of the upper jaw. Twenty-two per cent. arrest of lower jaw. Sixty-four per cent. had V-shaped or saddle-shaped arches or their modification and protruding teeth. Seventeen per cent. had hypertrophy of the alveolar process. Eighty-three per cent. had small teeth. Twenty-seven per cent. had extra tubercles upon the molars. Eighty-two per cent. had stenosis of the nasal cavity more or less marked. Thirty-six per cent. had deflection of the nasal septum to the left and twenty-nine per cent. to the right. Twenty-one per cent. wore glasses for eye defect. In fifty-eight per cent. there was enlargement of the thyroid gland and in seven per cent. arrest of its development. In two hundred and ninety-six cases of early lipomatosis (one hundred and eighty males and one hundred and sixteen females) coming under my own observation, there were ten cryptorchids, six hypospadiacs, and three cases of pseudo-hermaphroditism. Three females had infantile bifid uteri. Four had enlarged clitorides; in one of these the urethra perforated the clitoris, as in the female shrew. Of forty girls who had reached eighteen, only three had menstruated normally. The others were amenorrhœic or dysmenorrhœic, or had neurotic storms during the period. There were one hundred and sixty hebephreniacs among the number. Of these, one hundred and twenty had masturbated excessively. Ten had been nymphomaniac or satyriasic, the sexual appetite having become completely extinct at eighteen. Fifty of the non-hebephreniacs never showed any signs of sexual appetite. Three of the hebephreniacs were sexual invertes, while eighty practised various perversities. Of the non-hebephreniacs ten were cyclothymiacs, thirty had had acute forms of insanity, ten were epileptics, and fifteen hysterics. Thirteen had had chorea. Ninety-seven had difficulty in learning to speak and thirty always stuttered.

The appearance of the first permanent molar is of great significance to stomatologists and sociologists alike. The mental and moral deficiencies usually present will interfere with proper care of the teeth, particularly indicated in cases where such deficiencies occur. While the eye has received much attention as a sociologic guide, the teeth and jaws have, as a rule, been neglected, although of even more significance than the functional disorders of the eye.

The next important period of stress is practically that of the second dentition. Here there is a foreshadowing of the mental and nervous phenomena of the following period of stress. Sexual de-

These are apt to occur at this time as a reaction to temporary disturbances of health. The temperature at which psychic disturbances begin in a child is a fair index of its brain stability. Neuropathic children on a very slight rise in temperature or even without it are subject to attacks of unreasonable elevation, during which they are quite beside themselves, rushing about, wildly shouting, fighting, and without clear consciousness of their surroundings. With this last picture stomatologists are very familiar in children brought to them for care of the teeth. During this period such disturbances have to be taken into account in cases where maxillary and dental treatment and regulation are indicated.

The period of puberty should include the period from the appearance of the menses or of spermatozoa until the completion of the twenty-fifth year. The appearance of the wisdom-tooth at this time marks human maturity, which was the reason that twenty-five was selected for the age of maturity by the Code of Napoleon. During this period it is possible to correct dental and maxillary irregularities with benefit to the subject. Every one of the conditions enumerated as due to strain during the period between six and twelve may appear. In addition there occurs a type of mental disorder called hebephrenia, or insanity, of puberty, which is practically incurable after its development. This is an insanity peculiarly charged to cigarette-smoking, masturbation, over-study, religious excitement, and "love," all of which are the expressions of the defects and not their cause. These subjects in the earlier stage of their psychosis peculiarly require teeth regulation. In some cases the strain from the tooth irregularity may have sufficed to upset the unstable mental balance. The next great periods of stress in human life are those of the climacteric and of the senile period. The first is accompanied by the menopause in women and prostate change in men. The dental conditions marking these two periods of stress are generally involutional in character and require prosthesis, or treatment, not correction.

INFECTIOUS DISEASES.¹

BY ALICE M. STEEVES, D.D.S., CHICAGO, ILL.

A KNOWLEDGE of the possibility of transferring infectious diseases from one patient to another by means of instruments or otherwise, and of the character of the infection itself, is of the greatest practical value.

Of all diseases in which the infection is frequently carried from the mouth of one patient to that of another, perhaps the most important is syphilis. In this affection two different lesions are formed in or about the mouth, each characteristic of the disease and appearing at different periods in its course. The primary sore is frequently to be found upon the lips or within the mouth. This is especially true in children. The mucous patches of the secondary stage are usually seen in the mouth, where their seat is on the inner surface of the lip, the tongue, the palate, or the fauces. In size they are from an eighth to half an inch in diameter, and while they extend superficially they are never deep. They are whitish in color, with rounded edges, and are raised rather than depressed. These two lesions are the sources of most of the infection which causes new cases of the disease, the virus being carried by actual contact, surgical instruments, household utensils, or other accidental means, and to unaccustomed observers they may be overlooked or neglected or considered harmless because their true character is not recognized.

The frequency with which these conditions occur and the great danger attached to them should warn every oral surgeon to be ready to recognize them and to take proper precautions to protect himself and others.

The discovery that the germs of scarlet fever and diphtheria may be found in perfectly healthy mouths and throats, and the fact that these germs remain in the mouth and throat for long periods after the clinical signs of the disease have disappeared, suggest the probability that these diseases may be transferred from patient to patient by unclean instruments. Well-proved instances of this kind are indeed rare, yet this mode of infection is worthy of attention.

¹ Abstract of a paper read before the Section on Stomatology, American Medical Association, June, 1901.

The germs of diphtheria are sometimes found in tooth-cavities or in a healthy throat, and although they may not cause the disease in that individual because of his natural resistance, when carried to the mucous membrane of a susceptible person they may produce the disease in a virulent form. The bacillus of diphtheria may be the cause of all grades of sore throat, from a simple acute catarrh to an intense membranous inflammation extending into the nose and mouth, so that the true nature of a sore throat may not be recognized and the bacilli may be spread from patient to patient on septic instruments, as is so often done by means of infected spoons and forks.

Diphtheria bacilli usually remain in the throat two weeks after the membrane has disappeared, and have been found five or six weeks afterwards in some cases. The infectious nature of purulent discharges following scarlet fever, such as a rhinitis or pharyngitis, is now fully recognized, so that if after one of these infectious diseases catarrhal inflammations are present, the necessary precautions can be taken to prevent new cases of the disease.

In the same manner erysipelas, which begins so often at the juncture of the skin and mucous membrane, and pus cocci from suppurating processes in the mouth, may be transferred from patient to patient, and it is easily conceivable that the bacillus of tuberculosis could be taken from the mouth of a tubercular patient on dental instruments and be deposited in the mouth of another patient and then find its way into the lungs.

ORAL ANTISEPSIS IN RELATION TO "PREVENTIVE MEDICINE."

BY C. M. WRIGHT, D.D.S., CINCINNATI, OHIO.

THE conditions of oral sepsis are "caries of the teeth, gingivitis and stomatitis of varying degrees of intensity, suppurations about the teeth and from alveolar abscesses, osteitis, periostitis, necrosis, and maxillary abscess; also, inflammations in parts adjacent to the mouth, as tonsillitis, pharyngitis, post-pharyngeal abscess, etc."

These conditions are to-day considered septic because they are

the results of the activity of organisms intimately associated with the pus-forming varieties.

With these septic conditions we must give attention to the quantity of poison produced in the mouth and to the amount taken by deglutition into the stomach or absorbed by contiguous mucous membranes.

A single necrotic pulp would furnish a minimum dose, an amount that can be readily taken care of by the secretions of an ordinarily healthy individual if the poison is simply swallowed; but we can judge of the virulence of this small quantity of septic matter when it is closed in the root-canal by accident or design.

The succeeding acute inflammation, resulting in abscess and necrosis, and the pronounced systemic effects—gastric, nervous, and febrile—are such common results of this procedure that we are perfectly familiar with them.

We are not as familiar with the more chronic gastric and intestinal catarrhs, nor with other remote infections, including a great many which are undoubtedly caused by pyogenic organisms, as, for instance, suppurative nephritis, ulcerative endocarditis, etc.

Modern etiology has, however, directed our attention to the organisms of the mouth as possible and probable causes of some of these obscure diseases.

We are not familiar with the intoxications and their effects on central and peripheral organs, though we admit that the swallowing and the absorption into the blood of even minute quantities of the products of pathogenic organisms, continued for months and years, must produce effects that a diminishing physiological resistance will some day fail to hinder from an outbreak into serious disease of remote organs.

The *Medical Record* of New York created a sensation a few years ago, and aroused considerable excitement in the dental profession, by some editorial criticisms on the dentists' mistaken devotion to the fine mechanical operations on *diseased* teeth,—teeth which in the interests of *preventive medicine* should be extracted,—and I will venture the opinion that as a profession, and in our relation to the public, we are to-day liable to just such accusations by cultured physicians. As evidence, recall to mind the beautifully executed bridges of gold and porcelain, the crowns, gold bands, fine gold fillings, and other mechanical appliances which we see in mouths in conditions of pronounced sepsis, and which, if the health

of the patient was the consideration, we should unhesitatingly remove and throw aside, notwithstanding the costliness and fine finish of the appliances.

If we could put away for a while our ideas of the beauty of dental operative mechanics and fix our minds on the *health* of the mouth, at any cost or sacrifice, how much more real good we might accomplish in the field of medicine.

Let me present two pictures. A brother and sister, aged about nineteen and twenty respectively, have been under my professional observation for perhaps two years. The boy now has a mouth and throat as clean and sweet as those of a six-months-old baby. Every tooth has been extracted, and he wears a full denture mounted on vulcanite. The plates are kept fairly clean with sapolio and water.

The girl presents oral conditions of rapid and recurring caries of the teeth, gingivitis, a subacute tonsillitis, five or six pulpless teeth with cicatrices from past alveolar abscesses. She has a general tenderness of the teeth in mastication from some pericemental fault, frequent pain in the gums and teeth; her breath is often tainted, tongue furred, and at times suffers from acute stomatitis.

Two years or more ago the boy's mouth was in the same condition.

The girl complains that she is always in the dentist's chair or at the throat specialist's, and frequently remarks, "How much better off brother is than I. He never has any trouble and I am never quite free from it."

In relation to health,—general as well as local,—which of the two shall we select as the better subject?

This study has caused me much thought and, I may say, worry.

I have not advised the extraction of that girl's teeth, and yet, notwithstanding the care that she is willing to give—and this is not a little—and the opportunities that I have to afford occasional relief, she is fostering a septic nursery in her mouth with much discomfort to herself, and which is a potent cause for a general breaking down of her health through one or the other of the channels referred to at the beginning of this paper. The radical operation of extraction and plates might greatly improve the conditions.

We see hundreds of such cases in the course of a year, though the boy's is to-day a most uncommon one.

How do we satisfy our educated conscience as a profession in

such cases while the "results of oral sepsis" are daily becoming more alarmingly apparent to us?

With our present knowledge of general pathology and our increasing perfection in diagnosis, the recognition of the interdependence of the health of one upon all the other parts of the organism is imperative.

With this before us, it seems to me that our first consideration should be health—a healthy mouth, even if bands, crowns, bridges, and natural teeth must be sacrificed to attain this end. We must do this in the interests of preventive medicine.

THE USE OF SILVER-FOIL IN DENTISTRY.¹

BY L. S. CHILCOTT, D.D.S., BANGOR, ME.

IN this necessarily brief subject—the use of silver-foil in dentistry—I cannot hope to offer anything entirely new, but may possibly suggest a new application of that which is very old.

Silver has, in all probability, not changed since it was originally deposited, and physiological conditions have changed very little since the deterioration of the human teeth made dentistry a necessity. It is our knowledge of sepsis, acquired within the last few years, that causes us to be constantly reaching for something that will arrest the growth of bacteria and render our operations permanently aseptic.

The therapeutical value of silver in surgery was recognized ages before the germ-theory was even thought of. Silver plate was formerly used in trephining operations; silver wire is quite generally used for sutures at the present time, and silver-foil has been used, I believe, for about two or three years in permanent dressings for wounds that are considered free from infection.

I am unable to find any reference to silver in the form of a foil in dentistry except in the old text-books, where it is mentioned as being too susceptible to oxidation and as lacking sufficient pliability to permit its use as a filling-material.

¹ Read before the American Academy of Dental Science, Boston, May 1, 1901.

It was my good fortune last summer to have for a patient a very bright and intelligent young lady who is a senior in the medical department of Johns Hopkins University, and she inquired why I never used silver-foil. I told her that it was too harsh a material for me to do anything with. "But I beg your pardon," she replied, "it is so soft and loose in its texture as to make it difficult to handle, and, really, I do not see why it would not be useful to you, and when I return I will send you some of it." It came in due time, and I must admit that I found it as represented, not omitting the difficulty in its manipulation. I usually take about ten sheets and work it into a rope as best I can. It will not remain in form like gold-foil, but has a loose, fluffy appearance. I have some of it here, and you will see that it is very thin and requires much care in handling. It is not even suggested that it, by itself, is a practical filling-material, but it has its use, however, and I have had such good results that I should not want to be without it.

Silver in its solid form ranks high as a conductor of heat. But this material in the form of a foil, when placed in the cavity of a tooth, appears to be a very efficient barrier against thermal changes. This is attributed to the innumerable interstices and oxidation, and the chemist may determine just what structural changes occur.

Its use in cavities of decay in the oral teeth is not recommended, as it is liable to stain the dentine, but it will in many cases commend itself as an adjunct filling-material in the posterior teeth. Theoretically it is all wrong to use this foil in connection with amalgam, as it has a strong affinity for mercury, but it appears to work all right in practice, so far as I have been able to determine from the few cases in which I have used it, and time alone will determine the value of this combination.

In that large class of cases where a non-conductor and eburnification is desired, I can conceive of no better substance for a tooth preservative than this silver-foil in connection with that good, old-fashioned, non-cohesive gold-foil. With patients where this treatment would be advantageous, and there are thousands of them between the ages of eight and twenty,—those, in fact, of all ages whose teeth are of faulty development,—and in senile decay the cavity should be prepared exactly as a conservative dentist would prepare one for any metallic filling, and the bottom of the cavity given what would be considered a good, thick covering of the silver-foil, allowing it to extend up to the enamel in a thin layer on all

sides, and the remaining portion of the cavity filled with such material as the judgment of the operator may dictate.

Another use in which I have found this material very desirable is in the filling of pulp-canals. It, like everything else that I have ever used for this purpose, is not easily carried into small, inaccessible roots, but with care and the use of smooth instruments it can be put into nearly every pulp-canal that any one would attempt to fill without causing any irritation whatever. I have been surprised and delighted with the results from its use in pulp-canals in roots which have a large apical foramen or a perforation. I invariably place a little of it at the apex of pulp-canals before setting crowns. In one case where there was a good-sized opening through the side of a central incisor root which I wished to crown I stopped the perforation carefully with this foil, secured the crown in position with cement, and the tooth has given no trouble since. I have in many cases in the last few months opened into teeth with putrescent pulps, cleansed and sterilized the canals carefully, and filled the roots at the same sitting, and in only two cases have the patients complained of the teeth being sore, and they were so but a short time, the inflammation subsiding without further treatment.

A case which I witnessed with much interest was treated by a young man whom I was trying to help. He was in my office for a few days and never had seen the silver used. The patient, a young woman, had two teeth—the right superior central and lateral incisors—with putrescent pulps. The conditions appeared to be exactly the same. The canal of the central was cleansed in the usual manner, an antiseptic dressing on cotton placed in the root, and the cavity filled with a temporary stopping. The canal of the lateral was also cleansed, and at my suggestion was filled with the silver-foil, it first being dipped in an antiseptic, and the cavity in the crown filled permanently. This was all done at the same time. An abscess developed at the roots of the central, which I opened on the third day; but the lateral has not given the slightest trouble up to this time, it being now, if I remember correctly, about six weeks.

For these cases a sufficient quantity is torn from the rope and rolled into a small point, and only such portion used at a time as the operator is able to place in its proper position and condense. I am well aware that any material may have an unmerited record

by being used in a run of favorable cases, and in different hands of equal skill the same substance may be used with variable results.

Trusting that silver-foil has already found its way into many dental cabinets, that I may be benefited by the experience of others, and believing that it has germicidal effect when placed in contact with animal tissue, I heartily commend it to your consideration.

PROPHYLAXIS.¹

BY DR. J. H. BENTON, NEW BERN, N. C.

By prophylaxis is meant preservative or preventive treatment. Within every individual is fixed an incentive to strive to maintain his earthly existence, even when surrounding circumstances make it apparent that it would be better to let life pass away. The prolongation of life has ever been and ever will be a question for rumination. Naturally, the young might seem to be the only legitimate claimants for prolonged life, but we see the old grasping just as ardently for existence; and as the years go passing rapidly by, the aged person will strive to restrain the wasting of the vital forces and employ every so-called specific that may offer hope of longer earthly existence. To-day, as it ever will be, we see in earnest solicitation everlasting life, if not endless youth. The inclination to cling to life is not affected by the changes of time, and the followers of Brown-Séguard using for the perpetuation of human life and powers the elixir of life and those using the phospho-albumin treatment are as enthusiastic as are those hoping to reach the fount of endless youth.

Recently it has been stated that some great electrician has promised an electric treatment which shall practically banish death till the time when it may be sought voluntarily.

Early in the nineteenth century medical science turned away from the study of theory to the study of life,—anatomy, physiology, pathology, and sanitation,—and in later years is giving attention to the study of physiological and pathological chemistry. “The

¹ Read before the North Carolina Dental Society, Morehead City, N. C., June 26, 1901.

proper study of mankind is man." With the discovery of bacteria there has been accomplished such miracles in medicine and surgery as had never been dreamed of by mortal man. From all progressive countries have been successfully excluded cholera, yellow fever, and the leprosy plague; and typhus fever, which was formerly the scourge of every great city, is a disease now rarely named in the catalogue of causes producing death; and even typhoid fever for the past decade or two has been rapidly retreating before the advances of science. The mortality of diphtheria has diminished wonderfully since the introduction of the antitoxic treatment in 1892. In well-governed countries small-pox is almost unknown except in the slums of seaport cities: a rare disease now and scarcely ever epidemic—a grand triumph for preventive medicine. Consumption, by far the worst of all human plagues, is now yielding to the skill of the practitioner and sanitation, and it is hoped will eventually be driven out of existence.

It is now a well-established fact that, outside of imperfection of development and structure, micro-organisms are the cause of decay of the teeth.

Another fact equally well established is that the destructive action of bacteria can be arrested and the bacteria themselves destroyed by the use of suitable antiseptics and germicides.

The broad statement has been advanced that if the mouth could at all times be kept antiseptically clean no teeth would decay. The truth of this no person can gainsay, but, unfortunately, such a condition cannot be maintained. If the dental profession expects or hopes to occupy a prominent position among the professions, workers along this line must spring from our ranks, men whose lives and unceasing efforts shall be directed to the discovery of a system of dental prophylaxis. Within a quarter of a century marvellous achievements have been made by bacteriologists, whose unceasing efforts have been constantly encouraged by progress and success. The number of this noble band of workers should be annually increased from the young members of the dental profession, and those who have no talent for such work should give their aid, encouragement, and approval.

The prevention of disease may be attempted, it is very evident, in two different ways. We may attempt to avoid or remove the cause of disease, or we may try to make the body less susceptible to the action of such agents as produce disease. The success which

has been attained in modifying plants and lower animals by regimen and breeding makes it more than probable that man can in a similar manner be improved; physically, he is nothing more than a specialized animal, and his relation with the forces of the universe are not altogether unlike those of less specialized animals.

Among the many conditions requisite to retain and enjoy the blessings of health and immunity from disease that may be mentioned as of importance from a hygienic point of view are the local habitation or home of the individual, drainage of ground, thorough ventilation of the premises, clothing suitable to the season and climate and the degree of exposure of the person, sufficient bodily out-door exercise, taken daily in sunshine if possible, food of proper quality and quantity. "And God said, Behold, I have given you every herb bearing seed,"—that is, all the cereal plants, such as corn, wheat, rye, etc., whose peculiar distinction and characteristic it is to produce seed,—“and every tree in the which is the fruit of a tree yielding seed; to you it shall be meat.” In these words God assigns and points out to man the food most suitable for him. It is plainly intended that he should subsist on vegetable food—herbs, grains, and fruits. These only were allowed to and used by man in his first estate. The abstinence from animal food exists in the traditions of all nations as one of the characteristics of their golden age, or the age of innocence. All food should be properly prepared and properly masticated, and taken with regularity, followed by rest, repose, and sleep. The process of nutrition and restoration of the nervous and muscular system takes place mainly through sleep. Cleanliness is most essential to hygiene—cleanliness of the person, especially of the mouth; cleanliness in all things pertaining to ourselves, our work, and our surroundings. A clean conscience will exercise a wonderful influence for good.

Reviews of Dental Literature.

THE SALIVA A PROTECTION AFFORDED BY NATURE AGAINST CARIES. By Dr. A. Michel.¹

An accurate translation of the entire article is necessary to give an adequate idea of the subject as treated by the author. I shall only be able to give the main statements and some of the conclusions drawn from them. An important statement made by the author is that the cleaning and washing of the teeth to free them from the food remains, and the making slippery the bolus of food constitute the principle functions of the saliva. Its ability to change starch into sugar is only useful in that it facilitates the cleansing process by changing insoluble starch into soluble sugar. Apart from its function as a mechanical cleanser, two other activities are to be mentioned which help preserve the teeth. In the first place, its ability to neutralize acids; in the second place, its antifermentative action. The author gives several reasons in support of his view that the starch-sugar change is only an incidental action of the saliva. He cites the fact that the whale and the dolphin, which wash out their mouths and teeth freely with seawater, have very poorly developed saliva glands. Also that the carnivora, which do not eat starchy food, have well-developed salivary glands, which cannot be intended for their ability to change starch into sugar. But the most weighty argument is that lower in the alimentary tract such abundant provision is made for the conversion of starch that it seems probable that the work was intended to be done there rather than in the mouth. The author gives an elaborate analysis of normal saliva, and states various changes in health and disease, and then follows an interesting analysis of the drinking-water of the two towns of Würzburg and Lohr; also an analysis of the saliva taken from inhabitants of the two towns.

The results are as follows: The drinking water of Würzburg has fifty times as much calcium oxide as that of Lohr. And the calcium oxide of the saliva taken from inhabitants of Lohr is only

¹ Der Speichel als natürlicher Schutz gegen Caries von A. Michel. Deutsche Monatsschrift für Zahnheilkunde, 4. Juni, 1901.

one-sixth of that found in the saliva of inhabitants of Würzburg. The author is led to the belief that in regions where there is a lack of lime in the drinking-water caries is increased. This comes about in two ways: first, because not enough lime is present for the proper forming of the teeth, and hence they are structurally defective; secondly, the alkalinity of the saliva is lessened and it is not able to properly protect the teeth against the acids formed in the mouth.

After making many analyses of saliva, and noting the degree of alkalinity and also the frequency of caries, the author comes to the following conclusion: where a lessening of caries is found there is found an increase in the amount of sulphocyanic acid and an increase in the alkalinity of the saliva.

WILLIAM H. POTTER.

THE DEVELOPMENT OF THE PULP-NODULE. By D. E. Caush, L.D.S.I.¹

Among the many and varied factors connected with the development of hard tissues, there is probably none more interesting than that of the development of secondary dentine; and in the development of the latter there is one question that has often puzzled the student as well as the more advanced thinker, and that is, Why is the microscopic structure of the pulp-nodule usually so different from that of secondary dentine?

In our endeavor to answer this interesting question we will commence by making a microscopic examination of a tooth in which we have diagnosed pulp-nodules, and make a section with the hard and soft tissue combined. We shall at once see a great difference between such a section and one of the tooth in which secondary dentine has been formed, whether for the purpose of resisting the attack upon the pulp as caused by decay, softening of the dentine, or where erosion has had the opportunity of leaving its permanent marks; or if we examine the section of a tooth worn down by friction resulting from mastication or attrition.

In all these cases we usually have a more or less pronounced deposit of secondary dentine, either in the pulp-chamber or in the pulp-canals. This new deposit is always caused by more or

¹ The original paper was very beautifully illustrated, confirming the author's views, but the text is sufficiently clear without their reproduction.---ED.

less pronounced irritation from the *exterior* of the tooth or pulp, and the microscopic character of the new tissue corresponds usually to the structure as found in normal dentine, having tubuli often corresponding and associated directly with the tubuli of the dentine.

It would appear as if this new tissue had been Nature's method of defending herself from the attacks of the enemy from without, as the new tissue has been deposited by those cells surrounding the pulp itself, whose duty it is to protect the delicate pulp with its ramification of nerves, blood-vessels, etc., from external irritation; but in the development of the nodules of bone in the pulp this is not the case; the condition of the dentine does not appear to be a factor in the development of these nodules, as the irritation which eventually produces the pulp-nodule is produced *in the pulp-tissue* itself.

On examining a tooth there is nothing in the external appearance to suggest the existence of even the smallest of pulp-stones, nor can we take into consideration as a factor the age or sex of patients in the development of this tissue, as these nodules are to be found in the teeth of patients in their teens as well as in those of advanced age, and in many cases producing as much pain in the youngest as in those of old age; the result of my examinations tends to show that the position of the nodule is usually the cause of the pain produced.

In external appearance the nodules vary from a small, more or less globular, or oval, structure to that of any size or shape, controlled only by the size of that portion of the canal or chamber in which they are found. Thus, we have them from a minute point to those entirely filling the pulp-chamber, and in teeth of two or more roots it is not unusual to find them not only filling the pulp-chamber, but with spines of hard tissue passing into the various canals, and thus producing the most irregular-shaped nodules.

Their position is almost as varied as their outline, for, as I have already said, we may find them in the pulp-canals and pulp-chambers, quite free from the surrounding dentine, or we may find them attached to the sides of the pulp-canals, and quite surrounded by the dentine; we may, as I have said, find them anywhere in the pulp itself, from the entrance of the pulp at the apex of the root to the extreme end of the pulp-chamber. It is not the largest of these that cause the greatest amount of pain, as the pain is pro-

duced by the position and not by the size of the nodule; thus a small nodule near the apex of the canal will probably produce pain by the constriction of the pulp and, as a consequence, pressure upon the nerves, whilst a nodule much larger in size (unless there is pressure produced upon the nerves) may almost entirely fill the pulp-chamber without producing any discomfort. Though their size, shape, and position may vary very much, such is not the case with regard to their microscopic structure. All the nodules I have examined have a somewhat similar structure when viewed by the microscope. We have usually in the centre, or somewhere near the centre, of the developed tissue a space, more or less pronounced, and it is at this point that the nodule has its origin; it grows outwardly, and radiating from this point there are usually a number of more or less concentric rings caused by additional layers of calcified tissue; it is in this way a nodule increases in size; this may continue until two or more nodules touch each other and become united into one, thus forming a compound nodule large and irregular in shape. Its structure, as thus seen, is quite different from either ordinary or secondary dentine; we may sometimes find a few isolated irregular tubuli, but rarely do we find any tubuli approaching the character of those seen in secondary dentine; this may be accounted for by the fact that its origin is generally some distance from the odontoblastic layer, and the nodule is developed from a different layer of cells from that of secondary dentine. Its position would imply that no odontoblasts had taken part in its development, and if this is so, a very interesting question arises as to how these tubuli, if they are tubuli, are produced.

The origin of the development of the nodule is some irritation *in the pulp itself*, and I believe the primary object of the nodule is to cover up, by calcification, some substance that has been the cause of irritation in the pulp-tissue; its structure as well as its mode of development would lend itself to this supposition, for under the microscope we have a structure similar in appearance, and I believe identical in its mode of development, to that of the pearl found in the oyster, the origin of the pearl being a foreign body found in the mantle of the mollusc. As it is impossible for the oyster to get rid of this foreign body by absorption, it builds around this cause of irritation that which is known to us as the pearl. So in the development of the pulp-nodule the same has

occurred: Nature has found in that delicate and complicated structure, the pulp, something it cannot get rid of, something it cannot absorb, something out of its place, and the irritation produced by this something causes the pulp to endeavor to get rid of it; as, however, it cannot absorb it, there is nothing for it to do but to encyst it.

If this is the true origin of the pulp-nodule, we ought to be able to find in some pulps, as a result of microscopic examination, the exciting cause, and this exciting cause is, I believe, to be found in either a dead cell or cells, or perhaps a few blood-corpuscles that have by some means escaped from their ordinary course, either by the rupture of one of the capillaries or small blood-vessels abounding in the pulp; such an accident may occur by a sudden shock to the tooth, or, again, the corpuscles may be found out of their place as a result of the breaking down of some of the smaller arteries, veins, or even the capillaries, by disease such as the pulp is exposed to.

I think the former method is the one that usually causes the development of pulp-nodules in our younger patients, whilst undoubtedly the changes in the pulp lend themselves to the development of these nodules as age advances. We will suppose, from either of the above, or some similar cause, that such a change has taken place in the pulp, and as a result there will be irritation of a more or less pronounced character in this tissue, produced by what has become a foreign body; there are no lymphatics for the re-absorption of this body, it does not require a very great stretch of the imagination to trace the growth of the pulp-nodule on the lines laid down. The course followed would, I believe, be somewhat as follows:

The irritation produced by the foreign body causes an increased activity in the blood-vessels surrounding the cause of the irritation, and, as a necessary consequence, an increase of formative material brought to hand. This material is taken out of the blood by the surrounding cells, and it becomes a very simple matter for these cells to cover up the cause of the irritation by a deposition of hard tissue. This probably occurs as follows: The increased blood-supply, produced by the irritation, causes immediate activity in the cells surrounding the cause of irritation, and the result of the activity is to produce a number of new cells. The pressure produced by this increase in the number of cells again increases the

blood-supply, and after a time the cells deposit a hard tissue in the same manner as the cementum is produced. As the deposition takes place in very small quantities, and probably very slowly, we have a more or less perfectly calcified and, as a consequence, homogeneous deposition. This accounts for the structureless character of the nodule.

Again, we sometimes have a larger mass more rapidly formed, and perhaps nearer, or even including some of the odontoblasts in the newly forming mass. We shall then have variations in the structure, consisting of lacunæ with canaliculi, irregular spaces, and a few markings like the tubuli of dentine. As the calcification of these cells continues, we shall have an increase in the size of the nodule; in some cases this increase in size causes a further irritation of the surrounding pulp-tissue, and thus a constant supply of fresh formative material is brought to the cells. The increase of size eventually produces pressure upon the nerves of the pulp, and, as a consequence, frequently the most acute pain is experienced; this is the course, I believe, of the pulp-nodule when surrounded by pulp-tissue.

There is yet another class of nodule: though previously mentioned, it may be interesting to briefly follow its history. I refer to those nodules attached to the dentine. We may also, if we are fairly successful in our search, find them not only attached at one side, but entirely surrounded by dentine, and that at some little distance from the pulp-canal; wherever I have found these they have always been near the apex of the root and embedded in the last formed dentine; and this, I think, gives the key to the explanation of the position in which the nodules are found.

At the time the cutting edge of the tooth is passing through the gums the apex of the root is in an uncalcified condition, and with a new tooth in this position it is much more subject to a shock than it will be after it is fully erupted; as a consequence, we have a nodule formed in precisely the same manner as those formed in the pulp-tissue, with this exception: those found in the pulp-tissue are always formed *after* the calcification of the dentine has taken place, whilst the latter class are formed *prior* to the calcification of the tooth, and when first formed are surrounded by uncalcified dentine. Any careful examination of a tooth with nodules in this position will fully illustrate my meaning, as the tubuli of the dentine will be found to be bent around

the nodule, proving the nodule *must* have been formed prior to the calcification of the dentine. If it had been otherwise, and the dentine had been absorbed to make a space for the nodule, we should then have found the tubuli ending abruptly at or near the margin of the nodule, but this is not the case.

This will also account for nodules found in the pulp-canals but attached to the dentine, and here, I believe, the development has been the same as in nodules surrounded by dentine.—*Transactions of Odontological Society of Great Britain.*

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Reports of Society Meetings.

AMERICAN MEDICAL ASSOCIATION, SECTION ON STOMATOLOGY.

DISCUSSION ON PAPER ON "PERIODS OF STRESS AND THEIR DENTAL MARKS," BY DR. JAMES G. KIERNAN, CHICAGO.

(For Dr. Kiernan's paper, see page 680.)

Dr. Eugene S. Talbot, Chicago.—Mr. President, I have been interested in this subject for years, and have spent a great many years in the study of these conditions. I never have heard a paper so clearly define those conditions as the one that has been read. Some one has said that the discussion of dental subjects has been exhausted, but a knowledge of the conditions of the mouth, so far as hereditary environment and embryology are concerned, is still embryonic. There are some points which deserve attention. Dentists often remark that if patients were more careful with their teeth they would not decay, and then prescribe a course of treatment handed down for decades. The same old story is told of brushing the teeth, recommending the use of certain preparations, etc. As Dr. Kiernan said, evolution of the teeth is tending towards extinction of many teeth. Decay is the natural process, and all treatment on earth will not save teeth except such needed in the individual. It is not only a personal calamity, but it has become a national calamity. Study of teeth and jaws of the peoples of Europe shows teeth of men deteriorating where the people are not of a nervous tendency, as they are in other countries. Through

Greece, Turkey, Russia, then around through Norway and Sweden, and through France and England, there is evident degeneracy of the jaws. There are no peoples in the world whose teeth are decaying to-day like those of the English people. There are no irregularities of the teeth like those of the English people. In England it has become a national calamity, and the authorities have appointed committees and have furnished money to investigate the cause of decay of the teeth. All attention and the best methods of treatment will not save them.

There is another condition of the jaws and teeth that Dr. Kiernan has discussed,—the evolution of the second set of teeth. Dentists think they are able to treat pyorrhœa alveolaris or gingivitis, and some claim to cure every case. With them it is simply a matter of local application, a peculiar sense of touch with instruments, to remove all visible deposits. The condition, however, is atavistic, and the disease is preventable to a certain extent; still, should the individual live long enough, he would lose his teeth. This is a process of osteomalacia and an atavistic condition. As Dr. Kiernan has said, change of the teeth is going on continually. Where one tooth is shed after it has done its duty, another takes its place. Where the temporary teeth are shed by absorption, the second set takes its place. This absorption goes on and the teeth are lost in time. Not in all cases, but in the majority of cases, if the person lives long enough. Dr. Kiernan showed you a picture of degeneracy and arrest of development. This is a picture where the child has grown to manhood, yet remained arrested in development. If the internal structures of the body were examined, arrest of development is evident. All have seen such cases, since they are very common. This particular condition illustrated has arrest of development of the jaws. Dr. Kiernan remarks that temporary structures are changing from generation to generation. For this reason dentists should be careful in regulating teeth, especially in children of from one to twelve years of age. These children are in the condition shown. In this neurotic condition, this arrest of development, the nervous system is very easily involved, and also other organs of the body. Children are often invalided for years by having their teeth regulated, and dentists should be very careful on that point. Another point about regulating teeth in such patients needs attention. Dentists cannot tell just exactly how it comes about, but where the teeth are moved by springs, as is often

done by dentists, and by ligatures and all kinds of appliances, they cannot be held perfectly firm. Later in life occurs an absorption of the alveolar process at this very point, due to osteomalacia or alveolar absorption. Gingivitis sets in from regulation of the teeth, the jaws are never restored to health, and the absorption goes on until the teeth become loose and are lost.

I want to call your attention to the four-and-one-half-months-old embryo. All have seen children that have the appearance of age, with little hairs upon the face and ears, with wrinkles in the face, the hair frequently gray in spots, the skin drawn up, and the fingers long and slender. In such patients dentists should be very careful in the regulation of the teeth and in all operations. They always have irregularities, and the greatest care is necessary because of the unbalanced nervous system.

Dr. Vida A. Latham, Rogers Park, Ill.—I want to express a word of thanks to Dr. Kiernan for his very able paper. I think it is a good thing to have the tension made clear on pathological principles. Many teachers have made the statement that it is absurd to suppose that the changes are made through the nerve-functions. They can occur through tension, perhaps not permanently, but it is one of the factors underlying this development, or it may be through a case of retrogression. When we think of the enormous amount of force that goes on in the development of the teeth coming through four dental cycles, and of the congestion which involves the vasomotor and vasoconstrictor systems, we may come to the conclusion that it is due to the period of first stress. I have heard men advance the argument that pathological stress is absurd, that it cannot come from such a source.

Dr. G. V. I. Brown, Milwaukee, Wis.—I cannot say very much on this subject without encroaching on the paper that I expect to read by and by. I shall be obliged to disagree with our secretary, however, concerning the regulation of teeth, because I have to begin to regulate the teeth of these youngsters before they are entirely destroyed. In regard to what he says of the disastrous results following the regulation of teeth in children and young persons, I think it was rather the fault of the method than the age of the patient, and I am convinced that where that continual absorption went on it was due to the effect of occlusion of the jaws on account of malposition, which caused an irritation of the tissue around the mouth.

Dr. James G. Kiernan, Chicago.—I only wish to correct a little terminology which I think might be desirable in this Section. There is perhaps no such word as “degeneracy.” Now, the question is whether there is degeneracy or whether it is a disappearance of certain parts for the benefit of the organism as a whole. It is true a great many changes do occur in this way for the benefit of the organism as a whole. For example, the human teeth in number are disappearing. There is very good reason to believe that man at one time possessed at least two extra incisors. There is also very good reason for believing that the wisdom-tooth is tending to disappear. There is also good reason to believe that the human tooth is becoming microdont rather than macrodont, rather smaller than larger. Now, this is only along the general line of evolution with reference to the face and jaws. The human jaw itself with all its beauty, the human face with all its beauty, is degenerate. For biting purposes and chewing purposes it is not as valuable as the jowl of the lower races. It is an embryonic feature. This space has been made for the benefit of the brain space. The brain has been absorbing more and more space at the expense of the bones of the face. Therefore, in dealing with this question of irregularities it would be wise to look at it in certain cases as a normal process.

I throw out this subject for your opinion because I am not a dental scientist, but I think in certain cases it would be wise to study the teeth not only from the point of regulation, but also from the stand-point of removal a little more than is done. No human hand can turn back the clock of time and make a high type of man and restore the jaw of his prehistoric ancestor, who lived on food in which there was an enormous waste. The native or prehistoric races had beautiful teeth, but those teeth could not exist with the environment of the civilized races. Civilized man does not waste his food so much; he does not need to do so much chewing and tearing. In the only animal that can be compared with man, the dog, similar changes are taking place, and these changes are coincident with the changes taking place in civilized man. We have another factor that influences these changes. There are many race types with different jaws and different teeth. No races are pure considered from this stand-point; all races are intermixed. It is safe to say that every one of the English-speaking races has some prehistoric element in it; every one of the Teutonic

racess and every one of the Euro-African races have the same element in them, as have also the Asiatic. Now, these races have different types of jaws, different sizes of teeth, and from them comes the so-called Aryan mixture. These people are subjected to a new environment. It is, therefore, the duty of modern dentists to study how far in one case removal of the teeth in a certain type might be a benefit in correcting cases, and how far in another it might be injurious, and deal with the matter from that standpoint. You cannot deal with it in a general way, but you must take into consideration the individual conditions to which the patient is exposed. We read a great deal about the degeneracy of the teeth. It is usually ascribed to luxury. The degeneracy may be an expression of the advance of the human race. When man gets fewer teeth, then there would not be so much irregularity, and there would not be so much trouble in other directions.

DISCUSSION ON PAPER ON "INFECTIOUS DISEASES," BY DR. ALICE STEEVES, CHICAGO.

(For Dr. Steeves's paper, see page 686.)

Dr. Vida A. Latham, Rogers Park, Ill.—This is a subject that is hardly touched upon by dentists, but in connection with the physician we can accomplish a great deal in this direction. Many cities have a quarantine law, and in that way we can control these diseases in large cities; but it is more difficult where a physician is allowed to use his discretion in placarding a house. There is great latitude in that method. If a physician is not perfectly honest and upright, he can probably be persuaded by higher fees or in some other way to favor the family. A man will tell him that his wife goes out in society, that he must go to business, and the result is the physician does not quarantine the father of the family, and he goes to the bank or to his business without hinderance. I have had just such cases, and I have had to scold pretty severely. When a man comes home at night it is natural that the child wants to see its father, and, if possible, he will steal in to it somehow.

I have had two horrible cases of infection of little folks through the non-disinfection of instruments, more especially forceps. In one case that was referred to a specialist a syphilitic lesion was caused in the upper jaw through the use of unclean instruments. I did not care to bear a malpractice suit, and that case was referred to a specialist. In dental schools how many students are taken to

see bacteriological cases of syphilis in the oral cavities? They will not see those cases, because they are not pointed out to them. I have seen them, because I am practising medicine and dentistry. I have been in dental schools where they are not shown at all. Unquestionably students ought to study and know these conditions. Most of us if we should see a case would not recognize it. Therefore I hope the teaching of surgical cleanliness will be broader and deeper in all its branches.

Dr. Geo. T. Carpenter, Chicago.—I recognize the importance of being able to know these conditions when you come across them. The ordinary practitioner will not recognize these, particularly syphilitic lesions, and it is a very difficult matter, even where he suspects a case, to secure its history. Syphilis is a disease that is covered up, and sometimes the only thing the practitioner can do is to pursue syphilitic treatment in a suspected case, and there will be a response if his surmise is correct.

We cannot be too particular in regard to the absolute importance of sterilizing instruments. Less than a year ago I had a family connection in my office having work done. He spoke of a slight abrasion at the corner of the mouth. I cleansed it and gave it some trivial local treatment, and the incident passed from my notice. At the same time I held the chair of oral surgery in one of our schools. A short time after that a brother, who was a medical student at that time, asked me if I had noticed William's mouth. I told him I had not specially noticed it. He said he wished I would examine it, as he himself was a little alarmed. He had been taking one of the preparations of mercury, and he believed he had secondary syphilis. If a person teaching these things will let them pass from under notice what will the ordinary practitioner do? Consequently I think we should be alive to the existence of these conditions, but, above all, we should pay strict attention to the sterilization of our instruments.

Dr. A. E. Baldwin, Chicago.—I am very much interested in anything that pertains to this branch of the work. The statement is made that cleanliness is next to godliness, but I believe that cleanliness is godliness, especially in the dental chair. I do think we sometimes exaggerate the importance of the health departments of our large cities in regard to the transmission of many of these diseases. It is a question as to whether some of these diseases that are called infectious or contagious really are what the name im-

plies. Where these conditions are present in healthy mouths, for instance, tubercle bacilli will be present in the mouths of perfectly healthy people. I suppose the only conclusion arrived at is that we must have a proper condition of the system, so that the resistance is great enough to throw off the effect of this systemic poison. It seems hardly necessary to enlarge upon cleanliness, but I recognize the condition Dr. Carpenter speaks of. It requires a good deal of courage to own up to our shortcomings, but I think if the truth were told by all of us some things fully as bad or even worse might be said than those mentioned, but the only thing to do is to fix the fact in our memory that we must be exceedingly careful in everything that tends to the welfare of our patients, to the absolute cleanliness of our instruments, our hands, and our persons.

Dr. Jas. G. Kiernan, Chicago.—The only solution is to point to a rather serious error in Dr. Baldwin's statement. In the first place, two things are necessary, the culture medium for transmitting the particular germ, and the germ. There is probably no healthy individual that has not bacterial germs in his mouth, but, on the other hand, while he is immune under given conditions, those bacteria may be transmitted to another individual and the result be continued indefinitely. The particular medium may be immune, but he continues the danger. That danger, however, I think has been met by the prevailing practice in the case of dentists of using antiseptic washes. There may be certain bacteria in individual mouths, and those bacteria may not gain entrance into the system until after operation. This is the case with the streptococcus, the staphylococcus, and other bacteria, and the fact, as Dr. Baldwin states, of the existence of bacteria in a healthy mouth contains an element of danger greater than is generally recognized.

Dr. Vida A. Latham.—I would like to emphasize a point Dr. Kiernan brought out. I think doctors and physicians should pay special attention to the throats of children at school. How many children are allowed out under two weeks with an infectious or contagious disease? In England at least six weeks is required, or until all the scabs have disappeared. Here, of course, it is rather light, but there the mortality is greater. In the case of scarlet fever it may be only a light attack, and the child may be back in school in two weeks. I know a child who had a light attack of scarlet-fever whose mother allowed it to play with other children, putting kid

gloves on the hands of the child. Of course, there is danger of infection. I know a friend of mine, a young lady, who went to a house where there was a case of scarlet fever. She was informed that the little girl had been down with scarlet fever. The young lady went home, changed all her clothing, and went to another house; from there she went to a dentist's office, where she had an appointment. That is where contagion comes from. I do not think children should be allowed out as early as they are in Chicago.

Dr. G. V. I. Brown, Milwaukee, Wis.—I remember last year a gentleman gave us a very scholarly dissertation upon this subject, and it set me to thinking a good deal. Since then I have tried to do a little missionary work, and during the last year have given at various times before school boards and school committees and any who were interested an illustrated discussion of this subject, in which I tried to enforce the value of care in this direction by having views thrown from the lantern upon the wall illustrating the different germs already described, particularly the diphtheria bacillus, the pneumococcus, and so on. I do not think I can do better at this time than to emphasize again the necessity of doing something more than talking these things over among ourselves. We all know the danger of infection. We are benefited by having the idea that cleanliness is next to godliness impressed upon our minds, but if we would resolve ourselves into a committee of the whole and go out from here and spread the information until we made school boards and those who have charge of the instruction and care of young people recognize the importance of these things, we would be doing a great deal more than we are doing here now. I have tried to make it strong in speaking of diphtheria by calling attention to the fact that Park View had an epidemic of diphtheria, and at least one per cent. of the children had these germs in the mouth. In Milwaukee we have had members of the medical profession during an epidemic examine the mouths and throats of children every morning before school began, but it seems to me that is a good deal like locking the barn door after the horse is stolen, because by the time the lesion is manifest or the disease recognized, the child has already exposed more children than it would be possible for us to compute. The same is true in a large measure of tuberculosis. If one in every seven dies of tuberculosis, as has been stated by Dr. Senn, and others agree with him on that point, and the disease is so prevalent that it defies all our laws of sanitation, it seems to me the

practical thing to do is to begin right in the mouth. In by far the majority of cases of affections of the lungs the bacilli are in the mouths continually, and whatever care may be taken of the sputum of such people after it leaves the mouth, a little care taken before would be much better. It is a simple matter for public schools to have a large vessel at the door with some cheap antiseptic and make it obligatory upon pupils to rinse their mouths before entering the school-room. I am certain we would do more to check diphtheria and influenza by attending to these things than we can in any other way. I think it is well worth continually repeating until we are tired of it, or until we finally make the right impression upon the minds of the people in charge of our public institutions. We are not politicians, but if we can arouse the laity without politics by continually reiterating these facts before the people, we shall feel that our labors have not been in vain.

Dr. A. E. Baldwin, Chicago.—I just want to say that I do not see that anything Dr. Brown said adds force to what has been stated by Dr. Latham or myself. I think a great deal of harm comes from posting notices. I know they would agree with me in many large cities. Here is a case of a child that has scarlet fever. That child was isolated from the household and no one allowed to see it except the trained nurse; no one else ever went near it. Would it be right to isolate that whole building by putting a placard on the front door? They would not be incautious, they could not be affected at all by being in another part of the house. Does that little card eight by fourteen offer any protection? Not at all; it does nothing of the kind. I agree with Dr. Latham that there should be a rigid enforcement of separation between those affected and those not affected, children as well as adults.

Speaking of what Dr. Brown has said, I do not think tuberculosis is dangerous to us so long as it is in Dr. Brown's mouth. It does not circulate in that way. The only circulation it has is in the air or in food and drink, and the remedy he suggests would do no good in lung difficulties. If you could have any preparation to take into the mouth to destroy tubercle bacilli it would have no effect one-half hour later. Notwithstanding the isolation of these cases, you will find these Klebs-Loeffler bacilli, peculiar to diphtheria, in many mouths that are healthy, and we cannot look into every mouth. I do not want anybody to misunderstand me, I do not want to throw open the door to every diphtheritic case, but there are a great

many things that we advocate that are really not as far-reaching as we think they are. I think it is far from proved that many diseases that are called contagious or infectious are really so.

Dr. G. V. I. Brown.—I want to say just a word in illustration of one single point in this matter. I think we are generally agreed that we are all talking of what we do not know. In the isolation hospital in Milwaukee during an epidemic of scarlet fever the patients were immediately placed upon a system of treatment which included the disinfection of the mouth with hydrogen dioxide and oxygen, and the result was that out of one hundred cases there was not one single case affected by any of the various sequelæ that follow that disease. The suppurative process which very frequently is likely to follow, and almost invariably affects the middle ear, was entirely absent, and there is no question about the value and efficacy of that treatment, and it is now becoming an established factor in the treatment of other diseases. The same is largely true of typhoid fever and some modifications of that disease.

Dr. Alice Steeves, Chicago (closing discussion).—I have little to say, except that I did not expect so animated a discussion to follow so small a paper; however, I feel very much gratified. This paper has been the outcome of my own observation and experience. I have reason to believe that there has been infection from improperly cleaned instruments in several cases of which I had the care, and I thought it would be well to bring this matter before this section. I feel that sterilization and cleanliness, especially in schools, is not properly demonstrated to the students. We must have ordinary cleanliness before we can have surgical cleanliness.

ACADEMY OF STOMATOLOGY.

A REGULAR monthly meeting of the Academy of Stomatology was held at the rooms of the Academy, 1731 Chestnut Street, Philadelphia, on the evening of Tuesday, June 25, 1901, the President, Dr. S. B. Luckie, in the chair.

After the transaction of routine business Professor E. T. Darby addressed the Academy upon the subject of "Instrument Handles."

INSTRUMENT HANDLES.

BY DR. E. T. DARBY, PHILADELPHIA.

It was suggested to me a short time ago that as manufacturers are at a loss to know whether dentists prefer long handles or socket handles, they often are overstocked with one kind or the other; also that as students often do not know what to select in this line, it would be well to call up a discussion upon this point. The evolution of dental instrument handles is interesting, as is that of many other things in the practice of dentistry. In olden times the outfit of the dentist consisted of comparatively few instruments, and these few were, I think, what we would consider to-day clumsy of construction and badly adapted to our present mode of practice. The dental outfit could then be put into a box perhaps eighteen inches long, a foot wide, and six or seven inches high. You have doubtless all seen the equipment of the dentist of forty or fifty years ago. The instruments were fitted into a series of plush- or velvet-lined trays. They were not numerous, nor greatly varied in shape. The handles, which were made of ivory or mother-of-pearl, often ornamented with gold ferrules and carving, were apparently intended as much to impress the patient as to serve for operations upon the teeth. I do not know how I worked with instruments of that description with any degree of comfort, and am sure few would care to return to their use. It is true, we packed gold by hand-pressure, grasping the instruments in the palm of the hand. In working on the inferior jaw great pressure was often used in packing gold. I doubt if the average dentist to-day would use an instrument with a handle as heavy and large as those we used, except perhaps for burnishing or other great force. As in evolution, the handle was reduced, the size of the point was reduced, and this was marked when mallet force took the place of handle-pressure for packing gold. I remember very distinctly when, in 1862, Dr. Atkinson, of New York, constructed the first set of mallet-pluggers that were known to the profession. It consisted of thirty-four or thirty-six instruments with long, slim handles, and were intended for mallet use. From that day I almost entirely discarded the heavy handle instrument and made use of the mallet style.

Owing to my preceptor's influence, I early formed the habit of making my own instruments, and it became a pleasure to me, and during the earlier years of my practice I made a great many for my own use. Most of these instruments which I exhibit here I made many years ago.

With regard to the relative advantage of the long or solid handle and the socket handle, there is, of course, a difference of opinion. The socket handle is intended to effect an economy in the points which screw into it. This way of using an instrument is certainly the more economical. The point of the instrument wears down, and can only be renewed a certain number of times, because the instrument becomes too short and the quality of steel is much impaired by frequent heating and loss of its carbon; therefore the instruments become really almost worthless.

I was led some years ago to adopt a uniform style of socket handle in my own practice, having learned the fact that I became accustomed to a certain-sized handle for an excavator and another for a plugger, and was embarrassed by a change from one size to another during the same class of work; as, for instance, one put into a large handle a small excavator point. If, on the other hand, one put a large point, or large burnisher, or an instrument with a right angle, into a small-handled instrument, he would find he was working to a disadvantage by being unable to grip the handle firmly enough. For packing gold, handles of uniform size, that were smooth and yet not slippery like nickel-plate, satisfied me and felt more comfortable in my hand than one that was roughened. So I made for myself a large number of snake-wood handles and some of ivory, and tried to make them of uniform and appropriate size, which one can determine by the feeling imparted to the hand.

At that time we had no cone-socket handles, and I conceived the idea of drilling these instruments to a certain depth, which I accomplished by using a guard on my drill, which permitted a penetration of only three-eighths or half an inch. Each one is drilled to the same depth and reamed with the same reamer, so that every one of the points will fit securely every one of the set of instruments, by reason of the exact taper of both shank and socket. With the cone-socket points, unless set firmly in the handle, they are liable to turn or unscrew, just in proportion as the point of the instrument is inclined away from a direct line with the shank of

the instrument. They can be securely fixed in the handles by means of a pair of pliers, a specially recessed pair preferred.

In proportion as the point is small, the handle should be light and small. Let me illustrate that. If I take an instrument used in the canals of teeth and put it into a large handle, I would work to great disadvantage, constantly feeling something in my hand unwieldly and uncomfortable. If, on the other hand, I mount it in a light, delicate handle, so that I do not feel the weight, my touch is lighter and steadier. To make these light handles hold the points securely and yet be of very little trouble in making, I drilled them to a certain depth and tapped them. The points of piano wire were soft soldered into a drill hole in the end of a piece of German silver, threaded on either end to fit the tap-hole in the handle. The soft soldering does not draw the temper of the wire. This makes an instrument delicate to the touch and light in weight, and where the point is broken or it needs replacing it is very easily replaced. The way of setting the broaches into shellac was a clumsy way and not satisfactory. These little piano-wire points are made by grinding the wire down on a two-inch corundum-wheel which has a slight groove worn in the centre of its grinding face. Water is allowed to constantly drip upon the stone, so that the point can never be heated, though the lathe runs at a great speed. To make a hook on it, I bend the end in a pair of pliers, and if the point is too long I rub it on an Arkansas stone and shape it as I please; and so on with a variety of forms of piano-wire instruments.

The chisel is an instrument that is used by most practitioners. If it is not, it ought to be. The greatest trouble with chisel-handles is that you do not have an opportunity of grasping that chisel with a firm hold. To that end I have made my chisel-handles, many of them, short and with a bulbous end, somewhat like an engraver's tool, so that it will not hurt the palm of my hand.

Going back to the relative advantages of handles, I think it is a matter that every dentist must decide for himself. I do not think I could say that a long-handled instrument would be more satisfactory to you than a short or socket handle; at the same time there are disadvantages in the socket handle. The first I have already noted,—that the point is liable to loosen in it; that can be overcome in the way I have suggested. On the other hand, there

is perhaps a saving in the point. Though, if you put the aggregate cost of the point and socket together, you will find that your cone-socket, and the point that goes with it, costs more than the long-handled instrument. The instrument-makers prefer selling the instruments with long handles. Most of the instruments that are made at the present time are so infinitely better than those of twenty or thirty years ago, that the student or practitioner can go into a dental depot and can find almost anything that he wants well made and well tempered. We could formerly get burnishers and large chisels very well tempered, but it was a most difficult thing to get small instruments and excavators well tempered and well shaped.

It seems to me that it is of importance that students, especially those who have plenty of time, should know something about the manufacture and a good deal more about the tempering of instruments. Very often a man wants an instrument of a certain bend or curve or angle. If he knows how to shape and temper steel, he can go into his laboratory and in a few minutes make it. That advantage is tenfold greater when a man is located far away from a supply house.

As I said at the outset, this subject was suggested to me, and I am therefore simply in the position of starting a discussion of this subject.

DISCUSSION.

Dr. Guilford.—The point made in regard to the delicacy of touch was well taken. The handles of my cutting instruments are made of steel, and are such as we buy, but with the pluggers I almost invariably use the wooden handles. I buy the wooden handles and make them to suit me, or buy them ready-made. I do that for the reason that with the wooden handle in my hand I can feel where the instrument is going by the sense of touch much better than I could in any other way. There is one place where we particularly need to take advantage of that sense of touch, and that is in the removal of the pulp. I do not see how any one can undertake to explore the canal of a tooth or root, and remove the pulp and feel his way when he has a steel instrument in his hand. It does not make any difference how lightly it is made, it is still heavy. The wood conveys the vibrations to your hand. There is a handle of that kind made for that purpose which has a little chuck on the end of it; the rest of it is made of wood and I have

great satisfaction in using it. A metal handle for pluggers and light work is not satisfactory. Even ebony or vulcanite is too heavy; some lighter wood, made of a size to fit the hand, is better. The sense of touch should be cultivated in the dentist exactly as it is in the physician who depends upon it. I agree entirely with all that Dr. Darby has said on this subject.

Dr. William H. Trueman.—The handle of an instrument is a matter of personal equation. On reading the announcement on the card, I was reminded of a friend. He had a very large hand, and said that the small instruments were uncomfortable. He wanted something to fill up his hand, and he had an entire set made with the handles from a half to three-quarters of an inch in diameter.

I agree with both points that Dr. Darby has laid down. We should have the point in correspondence with the handle. If the point of the instrument be small and delicate, we want the handle to correspond so as to feel comfortable and not cramped. Since microbes have been around I have discarded nearly all the instrument-handles except those of steel. I can put them into hot water with no danger of their coming apart, and if the water is very hot there is no danger of spoiling the handle. With the exception of a very few, I desire to have a large handle, so as to get a firm grasp upon it and to be able to use considerable pressure in rotating.

I have them classified, and have a different handle for each class. The hoe excavators have a groove cut into one end of the handle. And when I see them lying in a case I know whether a certain one is a hatchet or a hoe excavator. The same way with my burnishers and my pluggers: each one has a different handle, so that I recognize it at a glance. Other instruments are silver-plated, to distinguish them from the nickel-plated ones. When I see an instrument anywhere, I know what instrument it is without having to look at the point. That was impressed on me by once having used an excavator for a plugger by mistake. I discarded roughened handles, as they made my fingers sore, and used the simple, smooth handle, and had them all nickel-plated, and I find I am not troubled with slipping.

The socket points I have discarded almost entirely. I use an instrument that has more solidity about it. I was troubled with the turning around that Dr. Darby spoke of, and adopted the

plan of using shellac to fasten them in; a very little put on makes it perfectly firm and it can be readily removed; but the microbes have interfered with that again, for the hot water will, in time, loosen it. It is very interesting to observe the changes which the instrument-handles have undergone.

Some of the older instruments were beautifully made and nicely finished with a great many curves and angles, and very beautiful to look at, but were very uncomfortable to use. A great many of them were ornamented with precious stones. I remember a set gotten up by Dr. Plato. The instrument-case was a small one, not more than one foot square, and the instruments alone cost fifteen hundred dollars. I saw them not very long ago, having been called upon to appraise their value. There was not an instrument in the case that any one of us would accept if we were compelled to use it. They had cameo handles, and were set with various kinds of jewels, but the very fact of the handles having such precious stones would interfere with their use. The simplest instrument that we can get, one that will not be injured by falling upon the floor, is the best.

Dr. Gardiner.—I do not know that I can add very much to what has already been said. I agree with Dr. Trueman as to the personal equation, and think that the instruments which one has been taught to use in the beginning are very likely to be the ones which will be approved of. It is very difficult for any one individual to select a handle which will suit every one equally well, because of individual peculiarities. For myself, I use nearly all styles of handles for different kinds of instruments. I have a great variety of them, and I like each one in its place. Dr. Darby has shown a great deal of ingenuity and skill in the manufacture and in the design of these handles, which seem admirably adapted to the purpose.

Dr. James Truman.—The evolution of the dental instrument has always been interesting to me, perhaps for the reason that I have gone through much of this experience. I oftentimes looked at Dr. Darby's instruments and wished that I had his skill when I was in practice, although I made a large number of my own instruments. In fact, in the earlier days of dentistry in this country it was necessary that every dentist should have some knowledge of the formation of instruments. It was almost impossible to get these properly formed. About 1850 all the instruments that

were procurable were made by the surgical-instrument-makers, and their tempering of the excavators, especially drills, was very bad. We had to re-temper, or make our own instruments, especially excavators, in order to get any good results. They were tempered so hard as to become dangerous in the hands of the dentist.

I cannot quite agree with Dr. Darby that the dentists of that period—that is, the better dentists—had these large-handled instruments. I know it was common to a certain class of operators to have large cases with splendidly jewelled instruments, and all that sort of thing, but I was under the instruction of Dr. Elisha Townsend, and he never had any such instruments, but all small-handled instruments. I myself never used at that earlier period any such instruments as have been described by my friend Dr. Wm. Trueman,—large-handled instruments for packing soft gold. Perhaps that was because they were not comfortable in my hand. I could get sufficient force from my fingers without the force from the whole wrist. That seemed to me a barbarous way of putting in fillings, even by the soft-foil method.

The evolution of instruments, from the period when smooth, round points were used in packing non-cohesive gold, to that of serrated points, is one of interest, for it indicates the progress made towards the introduction of cohesive gold which came in later. The increase in the serrations was gradual, but they became so marked in character as naturally to produce a reaction, and we are now back again to almost smooth points, which I regard as a mistake.

I agree fully with Dr. Darby in regard to the handles. I think he has made an excellent form of handle, but do not like the cone-socket, that is, the screw passing into the instrument. I agree with him that they are liable to become loose, but I cannot agree with Dr. Wm. Trueman in putting in shellac to hold them. That is not my idea of an instrument. I want a firm instrument. I should prefer all instruments solid from one end to the other.

Dr. Hickman.—The paper has been very interesting, and I am always glad to listen to remarks upon the tempering of instruments. Dr. Guilford spoke of wooden handles for broaches for the removal of pulp, which rather surprises me. Somebody taught me to use a broach without a handle, and even to cut off part of the shank. That might have been Dr. Darby. He did not teach

us to use handles then. I cannot find anything better than that. When you get just as near to the pulp as you can without a shank, you can judge by the tactile sense.

Dr. Allen.—In a collection of instruments that had not been used for sixty years, I came across a few oddities which I purchased as objects of interest. I have here a few samples of the large handles referred to by Dr. Trueman. You can see the immensity of the instruments, which have never been used, and, I believe, have been lying idle for sixty years. With the same outfit is a unique mouth-mirror scarcely a thirty-second of an inch wide, capable of doing work on each side of the mouth. I also have a couple of handles used for the last forty years daily for the introduction of amalgam fillings. These were the instruments of Dr. Bonwill, solid, strong, and as durable as the fillings introduced by him. They have been used so much that the serrations are almost worn off. Notice the uniqueness of the points. They are exceptionally strong and heavy. They were used by Dr. Bonwill on almost every filling that he put in.

Dr. Grubb.—As one of the younger members of the profession, I appreciate these opportunities to gain some knowledge from the experience of such men as Dr. Darby. I remember when at college I received information concerning the tempering of instruments, and it has been of as much use to me as anything that I ever acquired there in the way of instrument-use. The idea of the instrument-handles and points being in proportion to the surface they are brought against is something I have always followed.

Dr. Register.—There is no doubt in the world that different operations require different handles, for the very reason that many of the operations that we are performing require different amounts of force. In other operations we want to have a delicate touch, and you cannot get that with a large handle. I have been very much impressed recently with the necessity in certain operations of using small handles in connection with small instruments. Take, for example, instruments for the treatment of pyorrhœa. I do not see how any large instrument will help us much in the treatment of that disease. We want small instruments and we want small handles. The instruments that Dr. Darby has passed around this evening simply fill me with admiration. Certainly there is nothing in the office of a dentist who wants to do artistic work that is of as much help as a handle well adapted to the operation to be performed.

Without that I think many operations fail that otherwise would succeed.

Dr. Woodward.—I prefer the small instruments of steel to the larger instruments of wood, ebony, or ivory. Here are two double-ended instruments; the handles were made by Dr. Hollingsworth, of the S. S. White Dental Manufacturing Company. The four points I designed myself. I have ordinarily a prejudice against an instrument with two points. I want an instrument with only one point. But these burnishers work so beautifully, and can be reversed so quickly, that I have become attached to them.

Dr. Gaylord.—I am an admirer of the Darby-Perry spoon excavators, and like a double-ended handle. I put the right-hand instrument in one end and the left-hand instrument in the other, and find it very convenient to excavate from one direction, and, by turning the instrument in my hand, work in the other direction. It is a saver of time and handles; you know where the mating instrument is. The idea is applicable to many of the plastic filling-instruments. I have selected and purchased different knobs for each class of instruments, which aids in finding them. I am using the metal handles entirely, except in the pluggers, simply because I can boil and sterilize them. The gold instruments being used with the rubber dam on the mouth, I do not consider that they should be boiled.

Dr. Darby.—I have very little to say in closing. I neglected to speak of one point, and that was that in order to distinguish between plugging and excavating instruments, I have had the former gold plated. That only applies to the smaller plugger-points; the larger ones I use in the snake-wood handles, etc. My objection to a double-ended instrument is that one end may wound the palm of the hand. I got several wounds from a double-ended instrument in this way, and from an infected excavator that would be a serious matter.

Adjourned.

OTTO E. INGLIS,
Editor Academy of Stomatology.

Editorial.

THE MAN WITH ONE PAPER.

THE man with "one talent," if this talent or idea be used to the advantage and instruction of his fellows, is worthy of all admiration. All are not gifted alike, some are capable of doing many things equally well, while others must confine themselves to certain lines of work, and can do nothing beyond these worthy of notice. The cultivation of the one original idea has more than once not only made the man who possessed it financially comfortable, but has enriched the world. In fact, this may be said to be more universally true than the results obtained by those whose minds cover many things. The Edisons are a rarity, but Stephenson, Fitch, Fulton, Morse, Bell, etc., have been the representative types of progress in all ages and in all countries.

While this is true, the man with one idea in dentistry is apt to become burdensome if he thinks it necessary to duplicate this and reduplicate it just as long as he can find editors willing to publish. Readers of journals are familiar with this type, and editors have a feeling akin to horror when they have sent them the same old story, variously disguised under changed headings.

It is recognized that a single publication of an original paper rarely makes an impression. This is well understood by advertisers. They do not count on one or a dozen appearances of an advertisement to effect anything. They understand fully that it is only through constant repetitions that the mind gradually absorbs the idea sought to be conveyed, and that eventually the recipient is drawn irresistibly into purchasing the product. "See that Hump?" and "Uneda Biscuit" simply typify the fortunes made by thus playing upon a single string.

The modest man who, having spent weary days and nights evolving a truth in science, gives it out in a paper, and, having done this, feels, in a certain sense, relieved of all responsibility and cares very little whether the world receives his message or permits it to die unnoticed, yet sometimes finds that he is taken at his own valuation, and the world passes him by to glorify

inferior men. The history of scientific research is full of these forgotten workers. When Cohnheim electrified the medical world by his discovery of the migration of the leucocytes of the blood, and aroused thereby an almost endless antagonism from the advocates of the earlier theory of Virchow of cell proliferation, the work of Waller, of England, and his contemporaries was entirely forgotten, and yet the results achieved by Waller were, in all respects, equal to that of the German investigator.

The earlier workers in dentistry have reason to complain of the writers of modern papers, that the results obtained by them are rarely quoted, although both ideas and results are plagiarized with as little show of conscience as that exhibited by the ordinary shoplifter. The older and more completely buried in some long since forgotten journal, the better for this class of writers, for then it is certain that discovery will be reduced to a minimum. There is another class that will dress up the old originals in modern scientific thought and technical expression, and the new dress gives a flavor of originality so striking that even the original writer would have difficulty in recognizing his own child.

The man with one paper sends it to a journal with a direct, or indirect, promise that this particular publication is the only one favored. The innocent editor, presuming that he is dealing with a truthful man, accepts it, and when issued he finds that every dental journal in the country has published it. This is thought to be a brilliant stroke of advertising genius, but the editor once imposed upon in this direction mentally makes a black-list in which the energetic individual has a prominent place, and he ceases to be a contributor to that periodical.

The man who reads the same paper to a half-dozen different State and inter-State societies, and finally winds up with the National Association, is the man the societies should especially learn to avoid. To the reader of journals there is nothing more annoying than to be obliged to sit and listen to a thrice-told tale and one without any remarkable originality. This is constantly being done and, doubtless, will have been repeated again at our annual conventions.

The man with one paper is very apt to consider that he is justified in culling from general and special knowledge to make a very full essay, illustrating the grains of wheat in a bushel of chaff. If this were all it might be pardoned, but he is very apt

to give his own ideas upon subjects upon which he is manifestly ignorant. We have recently had several such instances. These would be amusing were it not for the fact that these crude notions tend to mislead others into false conceptions, and to accept stolid ignorance for authority. This fault is not confined to writers of papers, but is to be found in books written by careless authors. The writing upon any subject presupposes that he who attempts it has made himself master of all that has preceded his attempt, and in so far as he fails to do this he deceives his readers.

It is not pleasant to feel forced to call attention to the weaknesses of our co-workers, but the times require the truthful journalist and plain speaking. This is especially needed now, when the mental activity is more pronounced, than at any former period. The younger generation is making itself heard in unmistakable terms. The men trained in histology, chemistry, bacteriology, anatomy, etc., are coming rapidly to the fore with their original work. There is ample room for these, for the unsolved problems are many, not only here but in the more practical branches. There is no room, however, for the old stock subjects, nor is there room for the one paper in every journal in the land.

Obituary.

ARCH COOMBS HART, PH.B., D.D.S., M.D.

DR. HART died at his residence in San Francisco, Cal., May 28, 1901, of Addison's disease and acute cerebral hyperæmia.

He was born in China, Me., January 14, 1869; graduated from the University of the Pacific in 1889, from the Department of Dentistry, University of Pennsylvania, in 1892, and from the Medical Department of the College of Physicians and Surgeons, San Francisco, in 1897.

He commenced practice at Pacific Grove in 1892 and moved to San Francisco in November of that year, where he remained until his death. He was lecturer on stomatology in the Hahnemann Hospital College at the time of his death. He also held the office

of corresponding secretary in the California State Dental Association.

The *Pacific Dental Gazette* says of him: "Dr. Hart was a man of untiring energy, enthusiastic in his profession, and endowed with a mind which would not permit him to follow beaten paths, but led him to study along lines of original research in the various departments of dental science."

It seems peculiarly fitting that after well-spent lives the aged should pass on to other conditions, but it is impossible to feel reconciled to the loss of the young. Dentistry has added, in the past few years, many young men and women of thorough education to its ranks, with the result that its literature has broadened and the scientific value of its work is steadily on the increase. When, therefore, death invades the ranks of the younger generation, as has been the case in several instances in recent years, the loss is deeply felt. Dr. Hart had the enthusiasm of youth. He was an untiring worker, and doubtless exhausted his vitality by his constant efforts.

While his deductions from his investigations were not always in accordance with accepted opinions, and perhaps not always sufficiently proved to be acceptable, yet the energy displayed in continuing these investigations gave promise of rich fruitage in the future.

His independence of character was manifested in working his way through his dental studies without material aid from any one. To the writer he frequently expressed his satisfaction with this experience, and doubtless its necessary privations helped to strengthen his character for the serious work to which he had devoted his life.

While many were unable to understand Dr. Hart, and in many instances failed to appreciate his worth, there were more who knew his underlying strength of character, and anticipated that in the development of years much would be accomplished.

His death should carry with it a warning. The effort to accomplish in a few years that which should cover a lifetime has been the rock upon which many a life barque has been sacrificed.

Dr. Hart was married to Nella R. Lawrence in San Francisco, September 5, 1894. Two children, a son and a daughter, survive him.

Resolutions on the death of Dr. A. C. Hart, adopted by the Oakland Dental Club, June 5, 1901:

The Oakland Dental Club desire to express their great sorrow and deep regret at the untimely death of Dr. A. C. Hart, of San Francisco. The sudden ending of this life, freighted with so much promise, comes as a calamity to the dental profession at large, and fills every member of the Club with a profound sense of personal loss. The ending of a life which has run the due course of time attached to man in this world, and which has been filled with the largest measure of usefulness to humanity, may be looked upon as a benediction, but our friend who has been so suddenly removed from earthly environment was but upon the threshold of a career which has not only already enriched science, but gave vigorous promise of much larger contribution from his continued research, together with the added power of a maturer mind, and we cannot therefore but grieve at the abrupt termination of a life so auspiciously begun. Be it therefore

Resolved, That in the death of Dr. Hart the dental profession has lost one of its ablest, keenest, and most energetic investigators.

M. C. McNAMARA, D.D.S.

DR. M. C. McNAMARA, an old resident of St. Louis, died June 16, 1901, at Alexian Brother's Hospital, of paralysis. In his prime he was one of the most successful dentists, having at one time an income of not less than twenty thousand dollars a year. The St. Louis Dental Society held a special meeting at Dr. Conrad's office, 3666 Olive Street, on the 17th. After several short addresses by a number of the members, the following were chosen to act as pall-bearers: O. H. Manhard, William Conrad, Walter M. Bartlett, John H. Kennerly, B. L. Thorpe, P. H. Eisloffel, John G. Harper, Abel J. Prosser, and A. Tschirner. A committee was appointed to draft a biographical sketch of the deceased. The following is their report:

"Dr. M. C. McNamara was born in 1829, in Ontario, Canada, of Irish parentage. He engaged in mercantile pursuits there in his earlier years, and there married Miss Katherine Aquesta Martin, fourth daughter of William Francis Martin, a civil engineer in the employ of the British government. He was also a member of the Council in London, Canada.

"Dr. McNamara in 1863 removed to Philadelphia, and a year later came to St. Louis. Soon after his arrival here Dr. McNamara

was graduated from the old St. Louis Dental College, and began the practice of dentistry. Later he occupied a chair in the College.

"In 1896 Dr. McNamara lost his wife, and since then has taken little part in active business. He was a member of the Knights of St. Patrick, and of a number of charitable and Catholic religious organizations. He was a former president of the St. Louis Dental Society, a member of the Odontological Society of St. Louis, and of the Missouri State Dental Association.

"Doctor McNamara had a family of seven sons and two daughters. The survivors are four sons—Joseph T., John J., William F., and Edward J.—and two daughters,—Miss Frances K. McNamara and Mrs. F. L. Linton.

"Dr. McNamara was an all-round dentist, and took great pride in making his operations as near perfect as possible. He was ethical in every sense of the word. For a number of years he insisted on entertaining the St. Louis Dental Society at its annual meetings for the election of officers. These meetings were held at his spacious residence; after the business of the session was disposed of an elegant spread was partaken of in the dining-room.

"Personally Dr. McNamara was a fine specimen of an Irish gentleman and generous to a fault.

"Having been long connected with the Jesuit Church at Ninth and Washington Avenue, by special permit he was buried from St. Francis Xavier Church, Grand and Lindell Boulevard, Rev. Father Daniel McErlane, S.J., officiating, and was interred in Calvary Cemetery, Tuesday, June 18, 1901.

"JOHN G. HARPER,

"WILLIAM N. CONRAD,

"ADAM FLICKENGER,

"Committee."

RESOLUTIONS OF RESPECT TO DR. THEODORE F. CHUPEIN.

At a regular meeting of the Pennsylvania Association of Dental Surgeons, held Tuesday evening, April 9, 1901, the Committee on Resolutions upon the death of Dr. Theodore F. Chupein submitted the following, which were accepted and adopted:

WHEREAS, With profound regret the Pennsylvania Association of Dental Surgeons is called upon to notice the death of Dr. Theodore F. Chupein, an old, tried, and faithful member, it is meet and fitting that it should place on record its appreciation of his long and faithful services as a member, and of his far-reaching, earnest, and valued services to the profession he loved.

Dr. Chupein became a member of the Association September 13, 1876, and at once, with earnestness, took and continued to take with unflagging zeal an active part in all its work. He was elected recording secretary October 9, 1877, and by re-election continued to serve until his death, March 23, 1901.

His earnestness in professional work, his faithfulness as a member and officer of this Association, his manliness, and his friendliness well merit our most profound appreciation and respect. Be it therefore

Resolved, That by the death of Dr. Theodore F. Chupein the dental profession has lost an earnest and progressive member, and this society a firm and fast friend.

Resolved, That, bowing in humble submission to the will of Him who doeth all things well, we hereby express our heartfelt sympathy to his bereaved wife and family; and be it further

Resolved, That a copy of these resolutions be transmitted to his family, and published in the dental journals.

WILBUR F. LITCH,
WILLIAM H. TRUEMAN,
Committee.

J. CLARENCE SALVAS,
Secretary.

Miscellany.

A TEST FOR BEESWAX.—Beeswax is not only grossly adulterated, but entirely substituted with ceresin colored with an analine dye. The latter has the odor and general appearance of true beeswax, but the color is generally brighter and more brilliant than that of true wax. On keeping, the color may disappear entirely, leaving the wax a dingy white.

The simplest test for beeswax is to take its specific gravity. This is easiest accomplished by melting a little of the sample and dropping it into alcohol so as to form globules. These should be allowed to stand in the alcohol overnight, and then just enough cold water added to the alcohol to cause the wax globules to float

indifferently in the mixture, with either rising or sinking quickly. To be accurate, the temperature of the mixture should be just 15° C. (59° F.) when this is accomplished. The alcoholic solution is then poured off and its specific gravity, which is the same as that of the sample of wax, is ascertained by means of a specific gravity flask. A wax which will pass this test can be regarded as pure if the specific gravity corresponds to that given in the Pharmacopœia.

White wax is less likely to be adulterated than yellow wax, but it always contains a small portion of foreign fat, which is usually rancid.—WILBUR L. SCOVILLE, *Australian Journal of Pharmacy*.

METHOD OF MAKING REMOVABLE FACINGS.—Dr. A. E. Peck has an original method of making removable facings similar to the Mason. He takes an ordinary facing with the pins above one another and uses gold, 30-gauge, for backing, bending the pins down tightly. He raises the gold on either side of the pins to an angle of forty-five degrees, fills the V-shape with solder, and finishes to the desired thickness, after which he burnishes a piece of pure gold to this backing and stiffens it with solder. It can then be used the same as a Mason tooth.—*Dental Review*.

TO WET WHEELS WHILE GRINDING TEETH.—I find a simple and easy device for wetting a wheel while grinding teeth is to affix a small piece of sponge by means of a rubber band to the middle finger. This is easily held against the corundum wheel. It is a simple device, yet one of the handiest for the purpose which I have ever seen or tried. The quantity of water can be regulated just right with it.—C. C. JORDAN, *Dental Hints*.

MOUNTING CROWNS AND BRIDGES.—Were it possible to successfully manipulate gutta-percha, the advantages of ease of removal, insolubility, and the cushion-like effect afforded would render it practically ideal; but, unfortunately, it is difficult to

successfully manipulate in extensive cases, and requires considerable time and much effort in single crowns.

I usually give preference to cement, but always observe the precaution of coating the interior of the crown and post with a thin film of chloro-percha or gum of shellac to facilitate removal in case of necessity.—DR. H. F. GOSLEE, *Dental Register*.

HOME-MADE PORCELAIN INLAY FURNACE.—It is made of sheet-iron with joints riveted, and in size is five and one-half inches high, four inches deep, three and one-half inches wide, and fastened to a base of iron.

The opening for the muffle is one inch high and one and one-half inches wide, and admits a double muffle, which is three and one-half inches long, one and three-eighths inches wide, and seven-eighths of an inch high. Each muffle is made of nickel, twenty-four to twenty-six gauge, and formed by beating and malleting to a pattern of wood. In the bottom is an opening for the blow-pipe. At the top there is an opening or outlet for the flame and gases after circulating around the muffle. At the lower part of the opening for the muffle is a small shelf to facilitate the handling of the work. The furnace is lined with a mixture of fire-clay, powdered asbestos, and liquid silex. While this is in a plastic state, the muffle is inserted to embed the end in the lining, which, when hard, holds it firmly in place and prevents the influx of gas.

The blow-pipe used is of his own design, similar to the Fletcher blast. Ash's high-fusing body can be baked in from five to seven minutes; the low-fusing body in from one to three minutes. The approximate cost of the furnace is from one to two dollars.

The above furnace was designed by Dr. Wessels and exhibited at the Pennsylvania Association of Dental Surgeons on April 9, 1901.—*Dental Brief*.

SETTING BRIDGES WITH GUTTA-PERCHA INSTEAD OF CEMENT.—At the Minnesota State Dental Society, held at Minneapolis, Dr. A. E. Peck illustrated a new method of setting bridges with S. S. White soft gutta-percha instead of cement. He used stopping

slightly heated and placed it on the pin; then inserted the crown or bridge. The same was removed and the surplus stopping trimmed off. A drop of cement was then placed on the pin and the crown or bridge driven to place. The advantage in using the S. S. White soft gutta-percha is that it yields readily to heat.—*Dental Review.*

TO SECURE GOOD EDGES TO GOLD FILLINGS WHEN USING A MATRIX.—I wish to mention one thing in connection with a matrix, which I have used several times very advantageously, and I believe others have used it successfully. Fold over the matrix before placing it in position several layers of non-cohesive gold, so that it covers and extends beyond the margins of the cavity. It is necessary to have sufficient space to permit its being slid up between the teeth. When in position, it is wedged tightly against the cavity. Then insert an instrument between the gold and the matrix about the centre of that side of the cavity and force the gold carefully back into the cavity, so as to cover the floor and walls as far as it will go. This makes the gold continuous over and beyond all margins and leaves quite a quantity of gold between the matrix and the margins, held there firmly in place. You can then proceed in any way that you may desire in filling the cavity with cohesive or non-cohesive gold, and you are sure, with ordinary care in introducing and packing the remainder of the gold, that all margins are safely covered. DR. R. B. TULLER, *Dental Review.*

SIMPLE ELECTRO-GOLD PLATING APPARATUS.—A one-and-a-half-volt dry cell, that is ordinarily used for electric bells about the house, will generate enough electricity; two pieces of copper wire (the ends of which are attached to the poles of the cell) long enough to reach the vessel containing the plating solution; a porcelain or glass dish or cup that will hold about a half-pint or a pint, three inches in diameter, with parallel sides, is the outfit. In the dish is placed a fully saturated solution of cyanide of potassium in water. A piece of pure gold is attached to the end of the wire from the positive pole, while the metal to be plated is attached to the end of the wire from the negative pole. Both the gold and

the metal to be plated are now immersed in the solution, but not allowed to come in contact with each other. If the plating is going on, there will be an activity about the metal upon which the gold is being deposited.

There is a good deal of detail and experience needed before plating can be successfully done, even after the appliance for doing it is perfected.

In recommending the plating bath to be a saturated solution of cyanide of potassium, we are quite well aware that a gold chloride solution in cyanide of potassium is advised, but in practice it is found unnecessary. The gold chloride solution is expensive and easily spoiled. The cyanide solution seems to answer every purpose.—*Dominion Dental Journal*.

COCAINE SOLUTION FOR HYPERSENSITIVE DENTINE.—The *Dental Brief* publishes the following from the *Dental Register*:

I have four solutions, all of which I can depend upon,—one with alcohol, one with chloroform, one with alcohol and chloroform mixed, and one with a fifty per cent. solution of sulphuric acid. Cocaine mixed with all these acts beautifully. With the fifty per cent. solution of sulphuric acid it makes a very oily looking mixture, and is one of the best means I know of for the reduction of hypersensitiveness of dentine. The sulphuric acid solution should be neutralized before filling.

Current News.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

At the last meeting of the National Association of Dental Examiners, held at Milwaukee on August 2 to 6, the following officers and committees were elected and appointed:

President, John F. Dowsley, 175 Tremont Street, Boston, Mass.; Vice-President, Chas. A. Meeker, 29 Fulton Street, Newark, N. J.; Second Vice-President, J. A. Hall, Collinsville, Ala.; Third Vice-President, B. L. Thorpe, LaClede and Vandewenter Avenues, St. Louis, Mo.; Secretary and Treasurer, J. Allen Osmun, 588 Broad Street, Newark, N. J.

Committee on Colleges.—C. C. Chittenden, Chairman, Madison, Wis.; J. A. Hall, Collinsville, Ala.; H. J. Burkhart, Batavia, N. Y.

Committee on Conference.—M. F. Finley, Chairman, Washington, D. C.; E. E. Kirkpatrick, Oklahoma; Chas. A. Meeker, Newark, N. J.

Membership Committee.—Geo. Everett Mitchell, Haverhill, Mass.; Melville A. Mason, Indianapolis, Ind.; Max. N. Ebele, Louisville, Ky.

Committee on Contracts and Arrangements.—Chas. A. Meeker, Newark, N. J.

J. ALLEN OSMUN,
Secretary.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

At the annual meeting of the National Association of Dental Faculties, held at Milwaukee, August 2 to 6, 1901, the following officers were elected for the ensuing year:

President, Dr. Wilbur F. Litch, Philadelphia; Vice-President, Dr. G. V. I. Brown, Milwaukee; Secretary, Dr. J. H. Kennerly, St. Louis; Treasurer, Dr. W. H. Morgan, Nashville, Tenn.

Executive Committee.—Drs. H. B. Tileston, Louisville, Ky.; S. W. Foster, Atlanta, Ga.; D. J. McMillan, Kansas City; J. B. Willmott, Toronto, Canada.

Committee on Law.—Drs. H. W. Morgan, Nashville; W. M. Montell, Baltimore; F. D. Weisse, New York.

Ad Interim Committee.—Drs. J. P. Gray, Nashville; W. T. McLean, Cincinnati; A. H. Peck, Chicago.

HARVARD DENTAL ALUMNI ASSOCIATION.

THE thirtieth annual banquet was held at Boston, on the evening of June 24, 1901, with one hundred and twenty-three persons present.

The guest of the evening was General Curtis Guild, Jr., of Boston, who spoke upon "The Duties of a Liberal Education."

The following were elected officers for the ensuing year:

President, Henry W. Gillett, Newport, R. I.; Vice-President, Luther D. Shepard, Boston, Mass.; Secretary, Waldo E. Boardman, Boston, Mass.; Treasurer, Harry S. Parsons, Boston, Mass.

Executive Committee.—Waldo E. Boardman, Boston, Mass.; William P. Cooke, Boston, Mass.; Charles E. Perkins, Brockton, Mass.

WALDO E. BOARDMAN,
Secretary.

DENTAL COMMISSIONERS OF CONNECTICUT.

THE following have been appointed as Dental Commissioners of Connecticut: Edward W. Pratt, President, East Hartford; Wm. H. Loomis, Rockville; W. E. Hyde, Danielson; Horace Bascom, New Haven; J. Tenney Barker, Recorder, Wallingford. There has been no change in our State law as reported.

J. TENNEY BARKER,
Recorder.

NEW JERSEY STATE DENTAL SOCIETY.

At the annual meeting of the New Jersey State Dental Society at Asbury, Park, July 18, 1901, the following officers were elected for the ensuing year:

President, Wm. L. Fish, Newark; Vice-President, Frank L. Hindle, New Brunswick; Secretary, Chas. A. Meeker, Newark; Treasurer, Henry A. Hull, New Brunswick.

Executive Committee.—Frank L. Hindle, New Brunswick; A. S. Sutphin, Newark; A. Irwin, Camden; W. W. Hawke, Flemington; Oscar Adelberg, Elizabeth.

Membership Committee.—J. A. Duffield, Camden; G. M. Holden, Hackettstown; W. H. Pruden, Paterson; T. Star Dunning, Paterson; H. P. Marshall, Newark.

C. A. MEEKER,
Secretary.

NORTHEASTERN DENTAL ASSOCIATION.

THE seventh annual meeting of the above Association is to convene in Springfield, Mass., October 30 and 31 and November 1, 1901. The committee promises original essayists of more than local reputation. Forty clinics,—table and chair. Memorial Building, where the meeting is to be held, has three floors,—upper for meeting, middle for exhibitors, lower for clinics. One and one-third fare, certificate plan, on the railroads.

Springfield is a well-located railroad centre, with eight first-class hotels. All ethical dentists are invited.

EDGAR O. KINSMAN,
Secretary.

CAMBRIDGE, MASS.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE fourth annual meeting of the Southern California Dental Association will be held in Los Angeles on October 8 and 9, 1901.

L. E. FORD,
Secretary.

NATIONAL DENTAL ASSOCIATION.

THE National Dental Association, at its meeting at Milwaukee, August 6, 1901, elected the following officers for the ensuing year:

President, J. A. Libbey, Pittsburg, Pa.; Vice-President, East, S. H. Guilford, Philadelphia, Pa.; Vice-President, West, Wm. P. Dickinson, Minneapolis, Minn.; Vice-President, South, L. G. Noel, Nashville, Tenn.; Recording Secretary, A. H. Peck, Chicago, Ill.; Corresponding Secretary, Josephine Pfeifer, Chicago, Ill.; Treasurer, Henry W. Morgan, Nashville, Tenn.

Executive Council.—H. J. Burkhart, B. Holly Smith, J. Y. Crawford, M. F. Finlay, C. C. Chittenden.

Executive Committee.—C. S. Butler, W. N. Cogan, G. V. I. Brown.

Committee on State Organization.—J. Taft, Jas. McManus, H. W. Morgan.

Publication Committee.—A. H. Peck, F. L. Gilmer, G. V. I. Brown.

Local Committee of Arrangements.—H. J. Burkhart, M. O. Cooley, C. W. Stainton.

Next place of meeting Niagara Falls, N. Y.

UNION MEETING OF THE SIXTH, SEVENTH, AND
EIGHTH DISTRICT DENTAL SOCIETIES, STATE OF
NEW YORK.

THE thirty-third Union Meeting of the above Societies will be held in the Assembly-Room of the Osburn House, Rochester, N. Y., Tuesday, Wednesday, and Thursday, October 29, 30, and 31, 1901.

PRELIMINARY ANNOUNCEMENT.

“Will Nitrous Oxide and Oxygen supplant Ether and Chloroform in General Surgery and Nitrous Oxide alone in Dental Surgery?” Dr. W. J. Roe, Philadelphia.

“The Enamel of the Central Incisors.” Dr. Sylvester Moyer, Galt, Ontario, Canada.

"Some Embarrassing Educational Problems." Dr. W. C. Barrett, Buffalo.

"Amalgam: The Place it has won in Dentistry." Dr. F. A. Balachey, Buffalo.

"The Gingival Border from a Scientific Stand-Point." Dr. S. B. Palmer, Syracuse.

"The Ethical Relation of Dentist to Patient." Dr. A. C. McAlpine, Warren, Pa.

"Some New Lights on the Etiology of Pyorrhœa Alveolaris." Dr. J. B. Ernsmere, Buffalo.

Subject to be announced. Dr. R. H. Hofheinz, Rochester.

"Surface Markings upon the Teeth." Dr. J. J. Madden, Buffalo.

Subject to be announced. Dr. J. N. Crouse, Chicago, Ill.

Subject to be announced. Dr. B. S. Hert, Rochester.

"Diagnosis and Treatment of Malocclusion." Illustrated with models and appliances. Dr. H. A. Pullen, Buffalo.

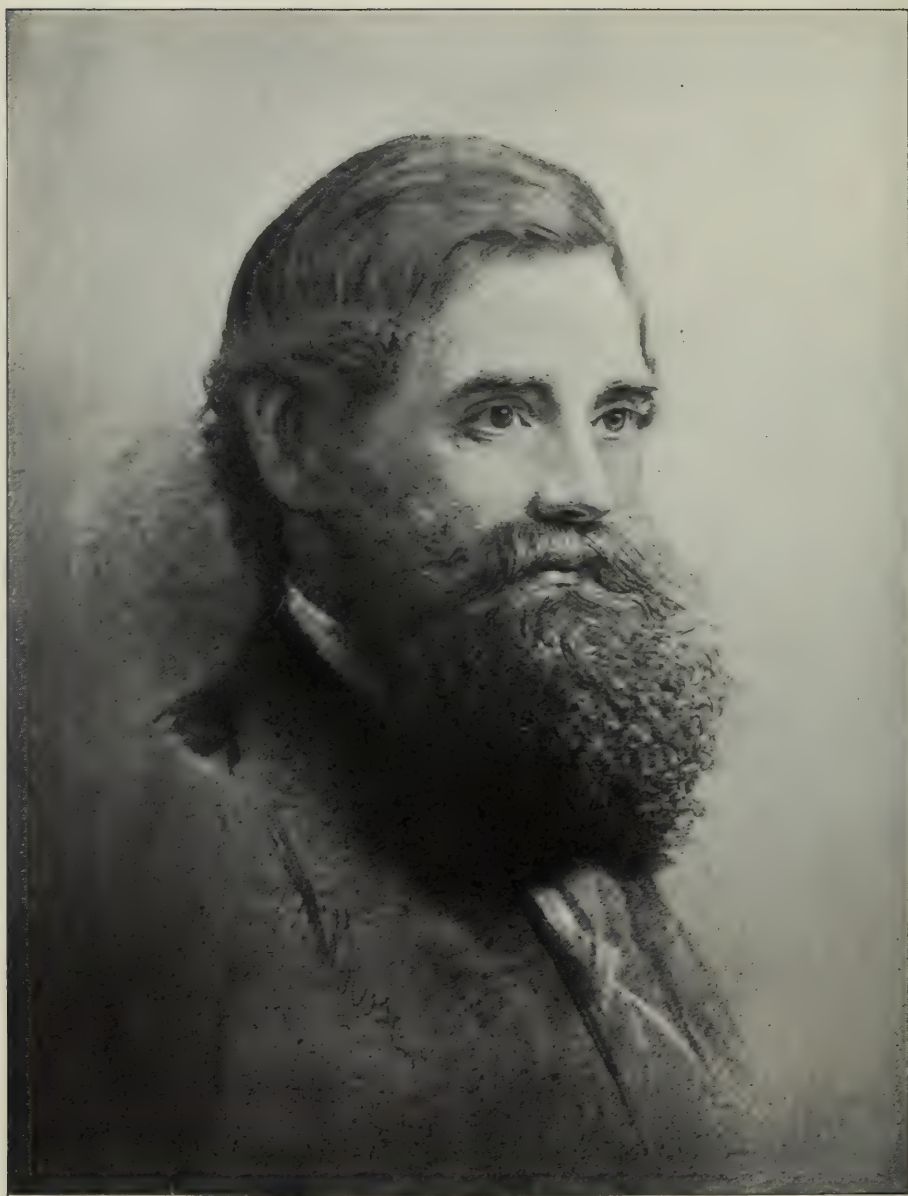
"Utilization of Artificial Light." Mr. E. L. Elliott, Newark, Ohio.

Subject to be announced. Mr. W. A. Purrington, New York.

The committee have under arrangement other important additions. There will be a great many clinics, together with a complete dental exhibit. The committee are making strenuous efforts to make this one of the best Union Meetings ever held by the Societies and well worthy of your attendance. Members of the profession are cordially invited.

DR. F. MESSERSCHMITT,
Chairman.

138 MAIN STREET, East, ROCHESTER, N. Y.



EDWIN JAMES DUNNING

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Original Communications.¹

SOME ÆSTHETIC CONSIDERATIONS IN THE TREATMENT OF TEETH IN THE INCISAL REGION.²

BY B. HOLLY SMITH, M.D., D.D.S., BALTIMORE, MD.

MR. PRESIDENT AND MEMBERS OF THE ACADEMY,—I believe that the suggestion that I should be here at this time was made by Dr. Andrews, and I count myself fortunate that my introduction to this society comes through one who is so highly regarded and honored, not only by its members, but by every one who knows of his work and worth; and as I come from a section where friendship means much, in that with us one's friends are often reckoned to do well because they are one's friends, I am emboldened to hope that the mantle of Dr. Andrews's friendship may cover any failure of mine to measure up to this opportunity.

It is not because I am under the impression that dentists as a whole are indifferent to æsthetic effect that I have determined to direct this discussion in the line indicated by the title of this paper, but because, by grouping many individual operations and subor-

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the American Academy of Dental Science, Boston, May 1, 1901.

dinating them to their influence upon the general expression of the mouth and the pleasurable effect upon the eye of the beholder, I have conceived that an emphasis may be given to the necessity of protecting our patients from any show of art or apparent imperfection in nature. In a community such as this, where culture and refinement are the rule rather than the exception, it is to be presumed that the necessity for many of these suggestions is not apparent. If this be true, which I doubt not, let me ask you to allow me to be for the time being your apostle, and hope that my printed rather than spoken words may find such a field as I know exists elsewhere, thus giving, with your approval, an excuse for their having been written.

American dentistry, looked upon from the stand-point of the salvation of teeth, has made a record which has, perhaps, no equal in the annals of other countries; and for ingenuity and resourcefulness the American dentist in his particular field stands quite the peer of those surgeons who perform to-day so many wonderful feats in operations upon the brain and abdomen. It must be acknowledged, however, that while this record was being made many criticisms have been passed which were not solely the result of jealousy, but had some foundation in justice. I have always contended for and insisted upon professional authority. The professional man knows, and therefore his views have right of way. His patients are, or should be, as clay in the hands of the potter; for this reason I am intolerant of the plea that there is a demand by the patient for any work which is open to criticism. The dentist created the demand for a gaudy display of gold, and in so doing, unmindful of his high and holy mission as teacher of his fellow-men, has given opportunity for the outcropping of that barbaric love of glamour.

If you will allow me to divide my subject into different parts, I think we may approach its discussion with greater ease.

1. The use of gold for filling.
2. Porcelain, oxyphosphate, etc.
3. Crown- and bridge-work.
4. Shaping the natural teeth.
5. Orthodontia for patients of middle life.

THE USE OF GOLD FOR FILLING.

It is easy to trace the influence of individual operators by the character of operations to be seen from the hands of their followers;

and this is the more marked when it is studied from a sectional stand-point.

Varney and Webb wielded a wider influence than did the teachers of operative dentistry in the colleges, and to-day their followers may be found thickest around the scene of their late activities. Unfortunately, however, for the reputation of the leaders, those who adopt their methods do not always grasp the true intent and meaning of the teaching; they have seen their operations and try to copy them, but their efforts are not guided by their deft manipulation nor modified by their careful consideration of effect. The live coal from the altar has not been used; the true professional inspiration is too often missed in the absorption of mechanics. This is one of the inevitable disadvantages; where the teacher's contact with the scholar is so limited, he does not have an opportunity to root and ground him in his principles, to train him in the detail of the work, to impregnate him with his high ideals. I recall having witnessed at the hands of the late Dr. Webb a beautiful operation. The cavity was a mesio-proximal one in a right superior central incisor; the labial plate of enamel was without support from dentine almost to the full extent of the mesial third, and the mesio-incisal angle was damaged. In the operation this labial plate was protected with cement, the incisal extension was made about to the middle of the distal third,—the extension being chiefly at the expense of the lingual plate. The whole operation was beautifully performed and finished, leaving very little gold in sight. And yet in less than a month I had occasion to see from the hands of some who witnessed this clever demonstration operations which outraged every æsthetic sense, but which were attempted because of what they saw performed by Dr. Webb.

With this lesson so vividly in my mind, I can but look with apprehension upon the Western agitation of "extension for prevention." In the hands of Drs. Black, Johnson, and a few others such a wise and discriminating application of the theory may be made that no great violence to æsthetics will result; but such teaching will end inevitably in the mutilation of teeth and the production of an effect which would remind one of the door of a brass foundry flung wide open. I have had recent occasion to see from the hands of very skilful operators some cases of extension for prevention run mad, and it gives me the excuse for making this plea for a more conservative practice. When the lips are parted in merriment, when

happiness, whose chief charm is its contagion, fills the mind and heart, no exhibition of dentistry should occur to mar the agreeable effect. With this in view, we would lay down the axiom that the labial surfaces of the incisors and cuspids should not, if possible to avoid it, be violated by the appearance of gold.

When proximal surfaces are to be filled, the teeth should be spaced with cotton from the lingual aspect, the linguo-proximal angle cut back slightly with chisels or enamel-trimmers, and the teeth filled preferably with non-cohesive gold, so that when normal position is resumed we have the slightest V opening towards the lingual surface. This teaching I know has suffered at the hands of its friends, but when intelligently applied it has stood the test fifty and sixty years, saved the teeth, and preserved the natural appearance. If the labial wall is deficient and such operation as above indicated would leave a space, the filling must be knuckled with cohesive gold, leaving, if possible, only a line of the material exposed. If the labial plate cannot be saved, porcelain or platinous gold should be used for its replacement. Whenever the incisal edge is to be extended, platinous gold should be used, as its effect is more agreeable to the eye than pure gold. As a rule, I should say that if any gold is to be exposed it must not be of the non-cohesive variety. I have had frequent occasion to replace gold fillings which produced the effect of a cavity in the tooth. Patients have complained that these fillings have been polished and repolished, but always remained unsightly, causing members of the family to accuse them of having a cavity in the tooth. Upon removing these fillings I have invariably found them to be non-cohesive gold. The effect, I think, is one of shadows. The gold surface has been left parallel with the opposing surface, the shadow of which, falling on the surface of the filling, makes it appear dark. With cohesive gold this filling can be restored with a slight contour, showing, it is true, a narrow line of gold, but even this is more agreeable than the cavity appearance. There is absolutely no excuse to-day for filling labial cavities with gold. It is not enough to demand of a filling-material to be used in these sites that it will stop the cavity; it must also be agreeable to the eye.

PORCELAIN, OXYPHOSPHATE, ETC.

If gold be criticised and condemned as unfit for labial filling, what can be said of the ragged, irregular appearance, both in form and color, of some of the work from the hands of the followers of the

so-called New Departure? Distance surely lends enchantment here. I have seen in some mouths certainly a half-dozen different-colored cements, not one of them resembling in shade the tooth it filled so imperfectly. There is opportunity for improvement along this line. A few of the manufacturers make several shades of powder; one, the Harvard, about twelve. Many of these, however, are unlike the color of any tooth I ever saw, thus leaving us to the presumption that they were intended to modify the white cement and make possible a good match to the shade of the tooth. By making these combinations and keeping sections as shade standards, with directions as to proportioning colors, etc., we might secure sufficient variety. Even with our best effort in this direction, however, cement should be used for temporary work only. If used for proximal work, it soon washes and wears, leaving ragged edges, which are both unsightly and uncomfortable.

Now and then we find samples of gutta-percha which seem to do fairly well both as to color and durability, but on the whole its use is limited to the protection of deep-seated cavities from thermal changes.

What, then, shall we use for filling-material in the incisal sites? There is nothing left but porcelain, and this is far from meeting every demand. It cannot be regarded as permanent work, used as it is to-day in the form of inlays baked in matrices taken from the cavity, and my experience teaches me that unless the adjustment is most carefully made they are liable to displacement or fracture. Improvement is going on constantly, however, both in furnaces and bodies, and every dentist should have access to a furnace and essay to do porcelain work of some kind. Failures may result at first, but success will ultimately come. Undercuts in both cavity and porcelain are essential. The inlay should have the glaze ground off the surface which is to be next to the cavity. When set with cement, a trace of the liquid without powder should be placed on this surface; by this we get an adhesion which is of great advantage. All this and many other things must be done, and yet the individual operations cannot be pronounced perfect, though the general effect is good.

When labial cavities the result of imperfections in the enamel are situated near the centre or in the incisal third of the labial surface, in filling much depends upon a nice marginal relation, and I do not think perfection can be so nearly approached with inlays

baked in matrices as with porcelain ground from sections of English teeth. I have many of these inlays which have been standing for ten or twelve years, where the relation was so perfect before they were set that they were difficult to remove from the cavity when fitting them. It may be objected that this work requires skill and time. I am sure that this does not in any sense bar it, as with a little attention to detail the average dentist is quite equal to its performance, and the average patient quite willing to pay for the time. It has the advantage of offering opportunity to match the shade exactly, and can be polished until the eye will not detect the union between porcelain and tooth. This polishing must be done with a wheel of fine grit, though the danger of damaging the margin of the inlay is not so great as it is with the baked inlay.

It must be that this grinding of inlays has fallen into disuse because of supposed difficulties which I do not find to exist, and I only insist upon its revival because I am assured by results that it will repay any effort. Then it need not be so tedious. I have the rough outline of the inlay made in the laboratory from a section of English tooth and adapted approximately to a cavity obtained from an impression. It comes to me shellacked to a piece of orange-wood or match-stick. A little fitting and grinding is usually sufficient to get a perfect adaptation, and it is then set with cement.

To those who contend that permanence and not effect is to be sought after, and that this can most frequently be secured when no restrictions are placed on the character of materials used, let me say that I am as anxious as any that no departure from the thoroughness which has given to American dentistry its reputation should obtain. If we will bring to porcelain work the same painstaking attention to detail, the same ingenious resourcefulness, which we have shown with gold, we will develop a degree of permanence not yet accomplished. Again, we are to consider that as the years go by the practitioner is in more intimate touch with his patients, who realize more and more that visits should be made at short intervals. The renewal or resetting of porcelain inlays is not taxing to patient or operator.

CROWN- AND BRIDGE-WORK.

Of all offences against good taste, the use of gold for the restoration of the crowns of incisors, cuspids, or first bicuspids is to my mind the last to be forgiven, and, fortunately for our credit, it is

not frequently done. It is quite common, however, to collar roots and tip porcelain teeth so that the gold may be unsightly, and this is quite unnecessary. I am convinced that the collar used in Richmond crowns is an evil to be avoided. The gingival relation to the neck of a tooth is so susceptible to change, and pericemental disturbances are so likely to be set up by the slightest encroachment of this collar, that (except in rarely inviting cases) it should be abandoned entirely. Instead, the root should be shaped high lingually if possible, the lingual half rising as a pyramidal process, while the labial half is cut back under the gum so as to form a bevel, over which the cervical edge of the porcelain face rests. The gold cap should be fitted with contouring pliers to grasp this lingual heel and be burnished down over the labial bevel, thus protecting the root effectively from fracture, making a strong crown, and avoiding any show of gold or danger of injury.

When tipping porcelain facings with gold is necessary, it is a good plan to bevel the facings at the expense of the lingual edge and have only a line of gold to cover the labio-incisal edge, making the occlusion, if possible, upon the lingual portion of the facing, where the gold is thickest; this avoids almost entirely the appearance of gold.

When abutments are required on cuspid or bicuspid teeth for bridges, bars should be used, filling around them with gold in preference to crowning them. Where gold crowns are found in the mouth covering the teeth under consideration and serving as abutments to small bridges, the labial surface of these crowns may be cut out and porcelain inlays introduced, making a marked improvement in the effect without greatly threatening the security of the bridge. Indeed, it is surprising what can be done when one's practice is set in the direction of avoiding a show of gold, and that this is desirable, nay, necessary, is the main contention of your essayist.

SHAPING THE NATURAL TEETH.

Abrasion of teeth as the effect of malocclusion is everywhere apparent in the mouths of people in middle life and old age. They have used their teeth vigorously, or by reason of the loss of some of the molars have made substitution of the other teeth for grinding. The shortening of the bite through the occlusal wear of the molars where they remain intact or by malpositions where only one is left almost invariably affects the relation of the teeth in the

incisal region. Most commonly the superior incisors are forced by the inferior to occupy a malposition labially. This flaring of the incisal edges of these teeth exposes often rugged and uneven margins and gives to the mouth generally a very unsightly appearance. The enamel from the incisal edge frequently is gone entirely, and the lingual as well as the labial edge of enamel is exposed to view. Sometimes individual teeth are forced entirely out of line. Any radical remedy, of course, would involve the bridging and crowning or restoration of the normal occlusion, but much can be done to improve the appearance and increase the comfort by stoning and shaping the front teeth, restoring as far as possible normal shape and relation.

Where elongation in individual teeth has occurred, the entire incisal third may often be removed, cutting in stages and using chloride of zinc where sensitiveness is encountered; this to be followed by a constant use of bicarbonate of soda on the part of the patient. As a usual thing dentine should not be exposed in a young mouth, but my experience shows no trouble from such treatment as above suggested, care being taken that the surface stoned and shaped be highly polished and burnished. This is an essential. When this character of work first appealed to me I had complaints; then I used the emery fine grit. Now I use emery, rotten and Arkansas stone, followed by pumice and whiting, the latter carried by moose-hide; finally, the burnisher is used.

ORTHODONTIA.

In the consideration of my last topic or division I have four cases to present. Irregularities difficult, indeed, apparently impossible from a remedial stand-point, often present. It is particularly embarrassing to have these passed on by those who should be, as we claim to be, well equipped for emergencies. However, if we will write on the first page of every new diary or engagement-book the pledge that with what knowledge and skill we possess we will wage war on disease and accident in whatever shape it may present, it may be an inspiration to us. For years I was under the impression, I think not an uncommon one, that the correction of irregularities after youth had lapsed into middle age was impracticable. This proposition with experience was outlived or out-practised by the help of the pledge.

The models which I present of some recent cases in practice may

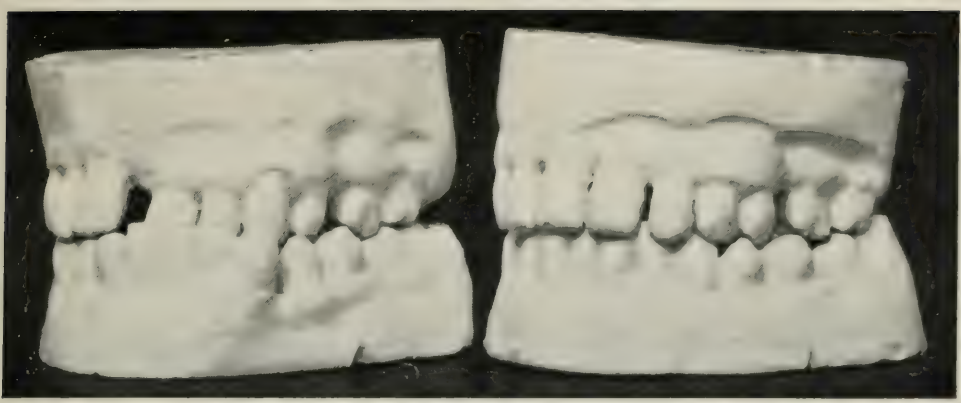


FIG. 2.

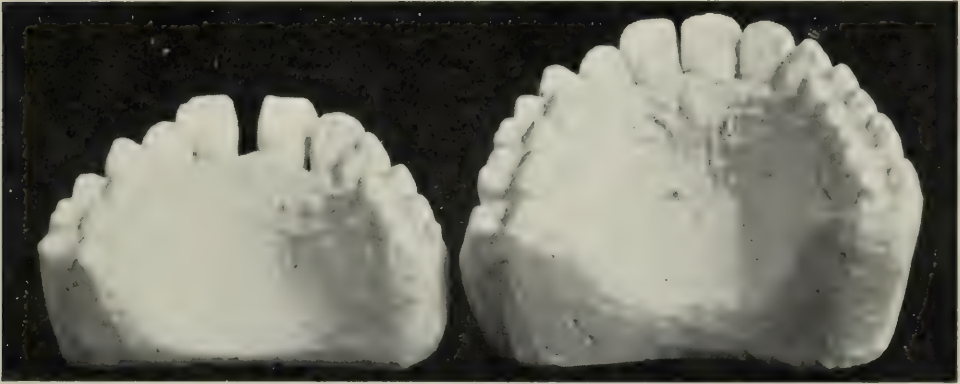


FIG. 3.

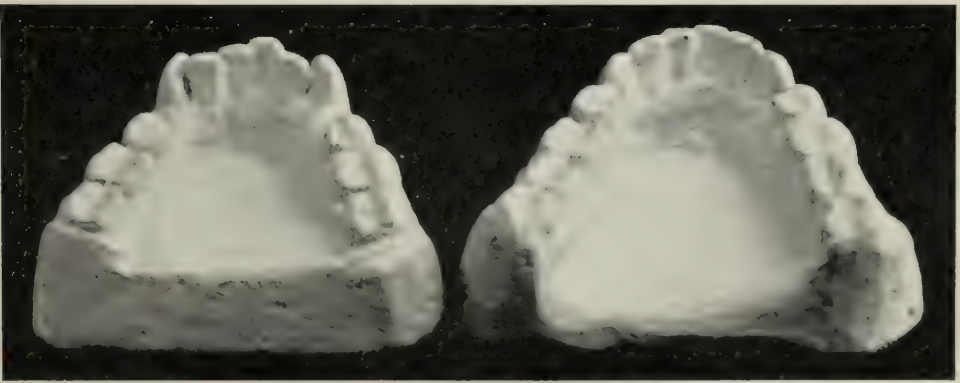
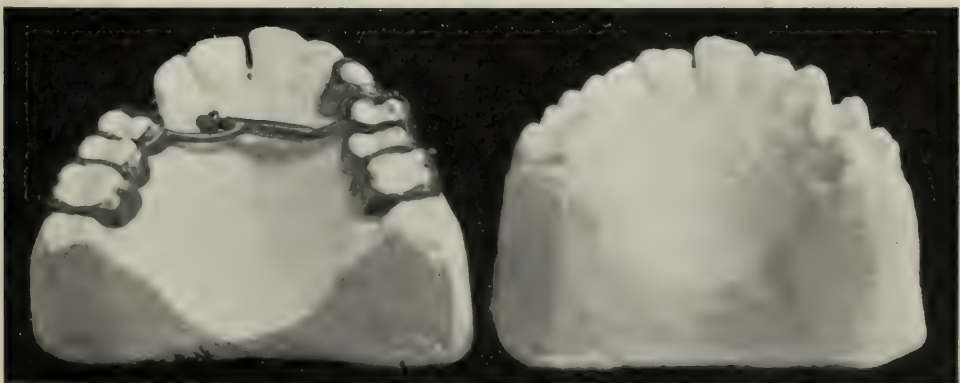


FIG. 4.



ROYAL COLLEGE OF DENTISTS

MAY 17 1903

TORONTO, ONTARIO

serve to encourage the attempt at correction without regard to age. The first case, a woman aged about fifty, had for twenty years or more been a patient of a gentleman who ranks very high as a skilful operator and capable practitioner. She was told twenty years before these models were made that she was too old to have her teeth regulated. The malposition promised to increase with age, and now it gave to the whole face an unsightliness which was painful. The least observing of her friends deplored it. She sought relief from her dentist in vain. Such correction as is shown in the models was made in about six months. The marked improvement in the expression of the face and the cheerfulness of the patient is not to be appreciated by observing these, but exists nevertheless.

Case second, a woman of forty-three years, had consulted several dentists, but received no encouragement. The two centrals gave to the face a monstrous appearance, which should have appealed successfully for relief.

Case third, from a neighboring city, aged thirty-five, had sought relief in vain for ten years. The correction is not complete, the work having been interrupted by pregnancy. The models show what progress was made in five months.

Case fourth is shown with appliance; the patient is twenty-eight years of age. He had appliances in his possession made by different dentists. This appliance is the third which I have constructed for him, the other two having been ineffective. This was placed in position, the patient instructed in its working, and requested to call in a few days. He returned in about a week with the tooth in position. The alveolus shows evidence of fracture. Though several years have elapsed, no indication of the death of the pulp is to be seen,—indeed, it is known to be alive and well.

These models are not shown as anything unusual; they represent conditions which may exist in any clientele. The emphasis I desire to make is that they all had opportunity for previous relief, which was not rendered. The inference is that there are at least a few practitioners who are, to say the least, indifferent to their opportunities for doing good. Until they are converted let us not fail to preach. May we not seat hard and fast upon the shoulders of every one the absolute responsibility of the dentist, not alone for the salvation of the teeth, but for the preservation or restoration of the mouth to its greatest effectiveness as the most expressive feature of the face.

Much that I have said in this paper might be appropriately said before a class of students, and you may think it impertinent in me to present matter before this society, composed, as it is, of past masters in the science and art of dentistry, which contains no evidence of original research and smacks so much of triteness and truisms. I will accept with what grace and cheerfulness I can command this stricture if you will allow my main contention, *i.e.*, that whatever may be the status of our knowledge and cultivation, the objectionable practices which this paper is meant to criticise still exist in nearly every section of our country. Practitioners who should and do know better allow the character of their operations to be determined by the measure of toleration on the part of the patient, and not by a cultivated sense of æsthetics, trained and obligated from the professional stand-point to do the best that can be done. From the stand-point, then, of my hearers these comments may be out of place, but this society and its members can have no higher or more worthy mission than the quickening and awakening of the professional conscience and the stimulation of our professional brethren everywhere to place their practice upon an ideal plane.

INTERSTITIAL GINGIVITIS AS A PROMINENT OBVIOUS EARLY SYMPTOM OF AUTOINTOXICATION AND DRUG POISONING.¹

BY EUGENE S. TALBOT, M.D., CHICAGO.

As autointoxication implies self-poisoning, it logically follows that if any excretory organ fails to perform its function the other excretory organs must do the work of that organ. This is accomplished but very imperfectly. The sweat-glands perform their function normally in the summer, but with the first breath of cool weather the glands contract and the liver and kidneys are forced to perform the work of the skin. Autointoxication takes place. The skin of the fingers begins to peel and itching with eruption results. Faulty elimination from the kidneys without disease of the organs will cause cardiac palpitation, headache, mental depression, dermatoses, rheumatism, gout, hysteria, epileptiform and

¹ Chicago Medical Society, February 13, 1901.

exhaustional psychoses. Asthma, hay-fever, adhesion of the lungs from pneumonia, undeveloped lungs and chest walls will cause blood impurities and skin eruptions from want of proper oxygenation of the blood. Faulty action of the liver, followed by constipation, results in sick headache, neurasthenia, drowsiness, skin eruptions, etc.

Dr. J. H. Salisbury¹ includes under autointoxication all diseases and changes in the system by which poisons resulting therefrom are not eliminated.

The more marked forms of autointoxication due to disease of the liver, bowels, kidneys, skin, and lungs, and the poisons from drugs, such as mercury, lead, brass, potassium iodide, bromide, etc., are more obviously existent. In health, autointoxication is never noticed until after the periods of growth are complete. Foods taken into the system are appropriated up to this period. After the tissues have obtained their normal development, although the same quantity of food is taken, so much is not required by the tissues. The waste material is carried into the blood. The amount of food required depends upon waste and repair. This depends to a great extent upon the avocation of the person. The older the person, the more effete matter needs removal. The excretory organs are unable to do the work they did at thirty. The effete matter becomes a poison in the blood.

The alveolar process is not present at birth. It does not commence to form until the teeth begin to appear through the gums. It remains while the temporary teeth are present. When these teeth are lost the process absorbs, but it reappears on eruption of the permanent teeth. When these teeth are lost, the process is again absorbed. The alveolar process simply holds the teeth in place while they are being used for mastication. The process is made up of cancellated bone tissue. Owing to the office it fulfils, it is easily absorbed. It is, therefore, the most transitory and the most easily affected of any structure in the body. It might also be termed a terminal structure, because the arteries and nerves terminate in the bone and gum tissue.

The mouth is a sensitive organ and rapidly indicates disease. Children with stomach and bowel disturbances reflect such lesions

¹ Constitutional Treatment of Interstitial Gingivitis, Journal of the American Medical Association, 1900.

on the gums and alveolar process. The tongue changes in color and the lips become black.

Absorption of the alveolar process is an inflammatory process. I have entitled this inflammation interstitial gingivitis. In interstitial gingivitis, therefore, the alveolar process as well as the gum tissue is involved. The inflammation, being interstitial in character, may be brought about by two methods, local and constitutional. Modern dentistry is doing most to produce local irritations resulting in predisposing causes; the application of the rubber dam, clamps, wedging of teeth, correcting irregularities, sharp edges of decayed or filled teeth, crown- and bridge-work, artificial teeth, more particularly ill-fitting plates, over-stimulation in the use of toothpicks, injuries, tartar, accumulation and decomposition of food, tobacco, and everything of a foreign nature that will produce irritation.

The local causes, which are easily recognized and can be handled only by a dentist, do not require discussion at this time.

The constitutional causes of interstitial gingivitis are auto-intoxication and drug poisoning. The autointoxication from pregnancy and change in climate have a most marked effect upon the alveolar process. The effect of changes of climate from a moderate temperature to extreme heat and to extreme cold, as well as high altitude, will produce the same result. This is noticeable in American soldiers in Cuba and the Philippines. The engineers and workmen on the Jungfrau Railway, two thousand six hundred meters above the sea level, suffer most intensely with this disease.

The alveolar process, containing two or more teeth, becomes involved, resulting in acute inflammation throughout. The pain may consist of slight uneasiness ranging to the most severe pain. The teeth loosen and finally drop out.

Interstitial gingivitis may affect the alveolar process and gums of defective, degenerate, and neuropathic children, children rachitic, or those who have had long illness. They are very susceptible to nervous impulses. People who have obtained their growth, that is, after thirty to thirty-five years of age, are the most susceptible and exhibit the most marked results from autointoxication and drug poisoning.

The poison due to autointoxication and drugs circulates in the capillaries, setting up inflammation. This extends throughout the alveolar process and gums.

Interstitial gingivitis produces four forms of bone absorption, —lacunar, or osteoclast, halisteresis, Volkmann's perforating canal, and osteomalacia, or senile absorption. Halisteresis and Volkmann's perforating canal absorption are naturally most common, since they are due directly to the inflammatory process and are likewise more rapid in their action. Lacunar or osteoclast absorption is nearly always present, but is slow. Osteomalacia or senile absorption is a natural process and attacks every individual sooner or later. Interstitial gingivitis is recognized by puffiness and bleeding of the gums. Absorption of the alveolar process causes a recession of the gums from the necks of the teeth, thus leaving the necks exposed. On account of the transitory nature of the alveolar process, if the inflammatory process be not arrested, the teeth will finally loosen and drop out. Pus infection frequently takes place. This especially occurs about the necks of the teeth, and the resulting products are taken into the stomach, producing indigestion. Treatment consists in the patient's drinking eight or more glasses of pure water each day, in brushing the gums with a stiff tooth-brush three times a day, thereby causing them to bleed, and the employment of proper mouth-washes. Tincture of iodine should be used upon the gums and alveolar process every other day until they are restored to health.

MILITARY DENTAL PRACTICE: ITS MODIFICATIONS AND LIMITATIONS.¹

BY HENRY D. HATCH, D.D.S., NEW YORK CITY.

MR. PRESIDENT AND GENTLEMEN,—What shall the new military practice consist of? What are its limitations and modifications? and How must the conservative civil practice be modified so as to best serve the interests of the army and the individual soldier? These are the questions with which it is the province of this paper to deal.

There are certain branches of dentistry, as it exists to-day, which

¹ Abstract of a paper read before the Section on Stomatology of the American Medical Association, at St. Paul, Minnesota, June, 1901.

it would seem wise to eliminate altogether,—namely, prosthetic dentistry, orthodontia, crown- and bridge-work, and gold filling.

Prosthetic dentistry would be impracticable for the following reasons:

First. The appliances necessary for the construction of artificial dentures are cumbersome and would add that much more to an already overburdened transport service.

Second. The time required to do such work is more than could be spared, owing to the few surgeons assigned to the service.

That orthodontia would have no place in military surgery is self-evident to any surgeon.

Crown- and bridge-work would hardly be feasible, except perhaps at certain army posts, for the reason that to be of any value it must be done with a certain nicety, requiring much time, many additional instruments, and much expensive material.

Gold filling is placed in this category for much the same reason. Gold filling, to be of any value, must be done under the most propitious circumstances, requiring a good chair, good assistants, dry, clean surroundings, many fine instruments, and plenty of time, the item of time being the most important in this case, as, with the present limited number of surgeons, to give the necessary time to one man would probably rob others of needed attention.

Eliminating, then, all the above, there still remains work enough for the most energetic and able men.

Let us now briefly glance at the positive side of the question. First, as to outfit. Other things being equal, the dental service will be popular in the army, as it takes up little room, demands few transportation facilities, and adapts itself to the prevailing conditions easily and uncomplainingly.

The outfit, then, should be as small as is consistent with good work, everything snugly packed and capable of being unpacked and packed again in the shortest possible time. One of the lessons taught by the Boers in their struggle for independence is that the modern army must return to the practice of Julius Cæsar, where luggage was reduced to the minimum. A portable head-rest attached to an ordinary chair would have to take the place of the regular dental chair, except at regular army posts. Anæsthetics could be given on the operating-table of the general surgeon, or on a cot-bed. The instrument-case could be mounted on a tripod or a table, and made to take the place of the usual cabinet.

An instrument sterilizer should, by all means, be made a part of the outfit, such as a Schering formaldehyde sterilizer, or the smaller one as modified by Dr. Stanton, of New York, or the formaldehyde sterilizer devised by Dr. Low, of Buffalo, which is perhaps more cheaply and easily operated.

Formaldehyde gas must prove to be the ideal sterilizing agent in military as well as in civil dental practice. It requires a very small quantity of spirits to generate the gas. As previously pointed out to the profession by the writer, boiling is the cheapest and most ready method of sterilizing where the nature of the instruments and appliances admits of boiling; but with dental instruments we have the mirrors, which cannot be boiled; also corundum wheels, engine hand-pieces, and many other things. But whatever the method, it is to be hoped that the dental surgeons will not lag behind the general surgeons in this respect.

OPERATIVE DENTISTRY.

The dental surgeon will at first be most often called upon to relieve pain, either by extracting or treating exposed pulps, alveolar abscesses, etc.; and here is where the high character of the men selected by our excellent examining board will have a chance to show itself, and prove to the army and the nation that the modern dental surgeon is something more than a mere tooth-puller.

Extracting may have to be done more often than in civil practice; but by using good judgment and adopting means adapted to the exigencies of the service, extracting may be reduced to the minimum.

Certain pulpless molar teeth, which, in private practice would be sterilized and filled to the ends of the roots, might be saved by using some of the mummifying methods, preferably Miller's, always filling over it with some filling that could easily be taken out, if need be, and the pulp-chamber and canals redressed. Or, in certain cases, extracting might be avoided by opening into the pulp-chamber at the cervix, and waiting until the case could have more thorough treatment. At any rate, root-filling should not be attempted unless the operator has the time and the facilities to do it thoroughly.

In extracting and other surgical work, it is to be hoped that anæsthetics, either local or general, will be used as they would be

in civil practice. Even a soldier ought not to be called upon to endure more pain than is necessary. Besides, many will be either in the hospital or on the verge of it, when rough treatment and shock might be the last straw. Any tendency to become brutal or rough, on the part of the dental surgeon, should meet with prompt rebuke or dismissal from the service.

The dental surgeon will have plenty of opportunity to observe and treat diseased conditions of the soft and osseous tissues surrounding the teeth. If there are carefully observed and accurate records kept, much will be added to our meagre knowledge of these conditions. The dental surgeon will see conditions caused by both mercury and the need of mercury, and perhaps will be able to get truer histories in the army than out of it.

That dental surgery merges into oral and general surgery so that a dividing line can hardly be drawn, goes without saying. Hence, it is to be expected that the dental surgeon will have much to do with fractures and gun-shot wounds involving the maxillæ. The use of interdental splints made of vulcanite or swaged metal would hardly be applicable in military practice, for the reason given above concerning prosthetic work. In their place could be substituted something after the Angle system of easily adapted bands and ligatures, or an easily made splint consisting of metal bands connected by hard solder to heavy platinum and gold, or iridio-platinum, wire, the piece made loosely fitting on a cast gotten from a modelling composition impression and cemented in place. An interdental splint in many instances, taking the place of vulcanite, may be made quickly and easily by cooling and trimming two side "bites" of modelling composition. In cases of resection of a considerable portion of the inferior maxilla, such a side "bite" of modelling composition, put in place immediately, answers an excellent purpose.

IDENTIFICATION BY THE TEETH.

For purposes of identification, after disaster by fire or flood, or other causes, where clothing is destroyed or the soft parts decomposed, experience has proved that identification by the teeth is the only reliable one. The condition of the bodies after the disaster to the battle-ship "*Maine*," and after the catastrophe of the Bazar de la Charité, in Paris, May 4, 1897, and many others, proves this. Therefore it is urged that the government be memorialized to the

effect that all officers and men in the army and navy, and all who shall be mustered into the service, shall have charts and casts made of their teeth by the dental surgeons of the army, or others appointed for the purpose, such charts and casts to be properly inscribed and filed with the proper departments for reference in case of death or desertion.

It would seem that, with the training the dental surgeon has received in aseptic methods and in minor surgery, he might be an excellent assistant to the general surgeon in emergencies, after battles, etc., thereby tending to promote mutual regard, and a better understanding between the two professions, now separate, but destined to become one.

Reviews of Dental Literature.

THE INFLUENCE OF METALS IN THE DEVELOPMENT OF MICRO-ORGANISMS IN GELATIN.¹—The author gives Miller the credit for making the first experiments along this line, and for showing that certain metals had the power of hindering the development of bacteria. His experiments were especially concerned with those metals commonly used as filling-materials.

Behring later confirmed Miller's experiments and extended the knowledge as to the controlling action of gold and other metals upon the growth of various bacteria. Behring held that there was a solution of the metal in the gelatin brought about by the by-products of the growing bacteria, and that only on this supposition could the controlling action of the metals upon the growth of bacteria be explained.

The author starts with the results obtained by Miller and Behring and undertakes a further development of the subject. His method was to place a piece of metal in a culture medium which had been infected with bacteria, and then to note whether the metal hindered or not the growth of bacteria. In this way

¹ Ueber Einfluss von Metallen auf die Vermehrung von Mikro-organismen in der Gelatine. Von Dr. Fritz Schenk, Wien. Oesterreichisch-ungarische Vierteljahrsschrift für Zahnheilkunde, Jänner, 1901.

were tested gold, silver, zinc, tin, lead, and iron. Of these metals, lead and tin showed no restraining influence over the growth of bacteria. With iron the effect was very slight. Gold, silver, and zinc, on the other hand, showed a marked influence. The influence of zinc was most marked. Further investigations were made to establish the duration of this action. It was found that at the expiration of twenty-four hours gold still exercised a controlling influence upon an infected gelatin, and that silver held a still greater influence than gold. Lead and tin exercised no influence at all. Iron showed only a very slight influence, while zinc showed the most lasting influence of any of the metals used.

The conclusion which the author draws from the last experiments is that none of the metals exercise a lasting effect upon the growth of bacteria.

After establishing the above results by repeated experiments, a further series was undertaken to determine whether the liquefaction of gelatin by heat was at all influenced by the presence of metals. For this purpose culture gelatin was heated in a water-bath and found to become fluid at 24° to 25° Celsius. But where the metal zinc was present under similar conditions the gelatin did not become fluid until 32° Celsius had been reached. The author feels that he has established the fact that such metals as hinder the growth of bacteria in gelatin also compel a higher temperature for its liquefaction.

In reaching this conclusion experiments were made with zinc, silver, gold, platinum, iron, lead.

The theory that a solution of a part of the metal occurs in the culture gelatin is favored by the author. And in this way a reason is given for the controlling influence which various metals have upon the growth of bacteria, and also for the ability which many possess of requiring a higher temperature for the liquefaction of culture gelatin.

If one seeks to gain some practical points from these very interesting observations upon the influence of metals upon the growth of bacteria in culture gelatin, he will be somewhat disappointed. For while several of the metals—notably zinc, silver, and gold—exercise a decided influence upon bacteria, this influence is only of short duration, and could hardly be considered of much value if relied upon in the case of a filling-material.

WILLIAM H. POTTER.

"THE MAKERS OF DENTISTRY." By Charles McManus, D.D.S., Hartford, Conn.—A paper entitled "The Makers of Dentistry," was read by Charles McManus, D.D.S., before the Hartford Dental Society, Tuesday evening, September 3, dealing with the history of dentistry and illustrated with *lantern-slide portraits of over seventy-five* celebrated American and European dentists. Among the number were A. Paré, Pierre Fauchard, John Hunter, Joseph Lemaire, James Gardette, John Greenwood, Paul Revere, John Randall, Leonard Koecker, Horace H. Hayden, Chapin A. Harris, Horace Wells, John M. Riggs, G. Q. Colton, Sir John Tomes, Sir Edwin Saunders, Thomas W. Evans, Elisha Townsend, S. P. Cutler, Edward Maynard, Jas. Taylor, Amos Westcott, Joseph Richardson, E. J. Dunning, Thos. B. Gunning, Asa Hill, R. W. Varney, S. C. Barnum, Marshall H. Webb, J. B. Morrison, B. J. Bing, W. H. Dwinelle, W. H. Atkinson, W. W. Allport, W. G. A. Bonwill, J. H. McQuillen, Thomas W. Parsons, S. S. White, J. E. Garretson, W. Herbst, W. H. Morgan, H. J. McKellops, Frank Abbott, Cushing, Emile Magitot, Charles S. Tomes, W. D. Miller, and many other well-known dentists who have contributed to the making of the profession.

Reports of Society Meetings.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Boston, on Wednesday evening, May 1, 1901, at six o'clock.

In the absence of both the President and the Vice-President, Dr. Thomas Fillebrown was chosen as the presiding officer.

Two papers were presented, one by B. Holly Smith, M.D., D.D.S., of Baltimore, Md., entitled "Some Æsthetic Considerations in the Treatment of Teeth in the Incisal Region;" the other by L. S. Chilcott, D.D.S., of Bangor, Me., entitled "The Use of Silver-Foil in Dentistry."

Dr. Fillebrown.—I am called to the duties of this office to-night very unexpectedly, but I am happy to say the duties of the presiding officer of the Academy are very easy.

It is customary, I believe, in introducing a speaker to pay him

many compliments; but I am happy to introduce a man to-night who does not need it, because he will before the evening is out establish his right and title to all the compliments we can give him. It gives me great pleasure to introduce to you, as one of the essayists of the evening, Professor B. Holly Smith, of Baltimore.

(For Dr. Smith's paper, see page 737.)

DISCUSSION.

Dr. B. Holly Smith (after his paper, referring to one of the models).—This patient had had appliances made to move the cuspid into line which were not effective. I thought at first the movement might be accomplished by using the bicuspid and molar on the opposite side as abutment. It was discovered soon that the cuspid was more firmly fixed than the opposing teeth to which the appliance was attached. I then included (as shown by the model) the bicuspid and molar on the same side as the offending cuspid. This was set with cement, the screws aiding in fixation. In about a week the young man came in with the tooth in position, as shown in the model.

Dr. Fillebrown.—It gives me great pleasure to add my personal endorsement to what the Professor has said to-night, with hardly an exception. The subject is now open for discussion.

Dr. Taft.—Will the essayist please state again what purpose these little screws on the side are intended to serve?

Dr. Smith.—It was found that the bridge was unseated; that is to say, the bands were unseated by the pressure, and after it once became loose it was determined to put those screws in so that a bearing or impact would be had on the bevel,—on the approximate bevel of the teeth,—and thus add security to the bridge. With the screws in position and without cement it was impossible to remove the bridge, but it was simply to give anchorage and steadfastness to the appliance.

Dr. Fillebrown.—If the Chair understands the gentleman, the screws pass in between the necks of the teeth, up near the gum, and, consequently, going in between, they cannot get past the bulge of the teeth.

Dr. Smith.—If you will allow me, Mr. President, I would like to say that I feel almost sorry that I brought these models. I hope the trend of the discussion will not in any sense be dwarfed by a consideration of this small exhibition of orthodontia.

Dr. Fillebrown.—There is not a man here who is not brimful. I know Dr. Andrews has something worth hearing.

Dr. Andrews.—Mr. President, I am always glad to hear and welcome Dr. Smith. What he has to say is well worth hearing, and the evening's paper has been particularly interesting to me, especially that point in regard to improving the appearance of the teeth by the simple method of shaping them. Perhaps every Fellow of the Academy has given more or less attention to this class of work and appreciates its value. I know of nothing that gives the same satisfaction to the patient when the operation is performed in an artistic manner. Every suggestion in the paper is worthy of our close attention, and there is certainly nothing that I can suggest to better his conclusions. One suggestion which seems to me particularly interesting and valuable is in regard to putting on bridges without the unsightly gold abutments, and putting on crowns without the gold band showing at the neck of the tooth. The method which I have used is somewhat different from the one which he described. I shape a band about two-thirds around the tooth, when I fit a crown similar to the method suggested by Dr. Litch some years ago. In making bridges, where I find it necessary to use a cuspid or a bicuspid tooth for an abutment I use the method devised by Dr. Marshall, of this city,—cutting a groove across the back of the tooth and down each side of it. Into this groove a U-shaped piece of platinum and iridium screw wire is fitted. Over this I burnish a piece of thin gold plate and solder the wire to the burnished plate. This cap of gold, with its wire, is used for the abutment of the cuspid or bicuspid tooth, and, soldered to the bridge, becomes its forward abutment. Cemented in place, this shows no gold whatever in front and adds very much to the beauty of work of this kind.

The matter of regulating teeth in adult life, I confess, is somewhat surprising to me. I have never dared to do it, or at least in only a few favorable cases. I have feared that the process would not form around these teeth, especially where there were any pathological indications. Dr. Smith's success inspires me with a new courage; I know that I shall profit by what he has suggested.

The paper is an inspiration to him whose mission it is to beautify the mouth. I do not think that there is anything else that I can say; the essayist has covered the ground so completely that there is little to be said, except in commendation.

Dr. Piper.—If it is in order, I would like to ask Dr. Smith a question with regard to this case of central incisors. How does he retain them? I have a case almost exactly like it.

Dr. Smith.—I should not hesitate at all to apply a backing to the lingual surface of those teeth, and, using a thread that we have in the little Howe set of instruments, I should set with cement and screw this thread into position. I would not hesitate at all to find anchorage in the dentine of these teeth and put on a backing to hold them permanently, not assuming that they would stay in position. I have no idea that they will. This is a case in process of regulating. But to see the woman when she came into the office! Her mouth was so unsightly that it seemed an eloquent appeal—if ugliness can be appealing—for remedy, for help. And when she told me she had consulted three or four dentists and asked if anything could be done, I felt sorry that such a state of helplessness was possible. Anything would be better than the condition we have at present. And, of course, your own resourcefulness would suggest something to hold those teeth in position.

Dr. Piper.—I would like to state that that is just what I did.

Dr. Fillebrown.—If you will permit a departure from parliamentary rules, and allow the Chair just a word in regard to this process, I will state that I have verified the wisdom and benefits of that operation in at least half a dozen cases. One marked case, and I think about the first one I had, was some ten years ago. A patient was referred to me with upper central incisors just like this, very seriously affected by Riggs disease. I put on a rubber band and drew them together, which was quite easy to do. Then I drilled a hole in each tooth just in front of the cingulum and made a little staple (I did not trouble for any screws) that just reached into the holes that I drilled, and hooked it in so that the spring of the teeth would hold it. I filled with amalgam, and the teeth have remained in position. Had I known, I would have brought the model of them. They are now in perfect position. Although they were very seriously affected with Riggs disease, there is scarcely a trace of it around the teeth at the present time.

I think it a most admirable way to do, perfectly reasonable, and it may be made entirely successful. In one case four teeth were in bad positions from Riggs disease. I brought them into place and struck a backing of thin gold, and, putting in pins, cemented them, and thus held them in place for a long time.

Dr. Werner.—The paper is full of suggestions, and the Fellows of the Academy appreciate them as nicely stated. Often we should abolish the use of pure gold in the incisor region, substituting platinum and gold, if we have to use a metal filing.

Then the ground inlays in distinction from the baked ones must be very apparent to all of us.

Then the motto in his appointment book,—to it I wish to add Lowell's quotation, that "not failure, but low aim, is crime." Let us think of it often. What a satisfaction to do a real good thing, for which your patient will be thankful to you forever! We should have that high aim,—i.e., to do the nicest thing for the longest time.

And as to the gold crowns on bicuspid or molars, to me they are ugly-looking things. How much better to have a carved tooth that looks like the other teeth.

There are many other points that might be favorably commented upon. We should never do a merely mechanical thing, at the expense of all laws of æsthetics and nicety. There is a vulgarity in the show of gold in or about the teeth.

It is difficult to match cements for teeth that have had the rubber dam on. Hence I make it a point to mix the cement to the color of the tooth in its moist condition, and not as the tooth is after the rubber dam has been on for some time.

Dr. Fillebrown.—No discussion is complete without a word from Dr. Meriam, when he is present.

Dr. Meriam.—Mr. President, I think we can all say with—I think it was one of our Boston poets:

"And there's a nice youngster, of excellent pith;
Fate could not conceal him by naming him Smith."

Through all this paper we can see the man behind it. To my mind, to-day as much as ever, perhaps I will say more than ever, with the multiplication of our appliances and everything of that kind, there still remains this, that you have got to have the man, and the purpose of the man directing all these things, to get the best results. That which is introduced as an adjunct may without judgment and care be the unmaking of a man. Your cements and amalgams, if the man has not the purpose to keep the work up and his practice up, can be the means of making him lazy, of shrinking from the objections of his patients, so that he does not devise and does not do the best things. That, I think, is perfectly

true. And so it is a refreshing thing to think that a practitioner starts out each year with a high resolve.

There is another thing that the essayist spoke of, the crowning of teeth, and I think what he says is very true where we decide upon the amputation of a tooth. But when it comes to the tooth that has decided for itself, being broken and irregular, I do not know of any way of caring for this tooth except by bands.

There is another question, and I have done something at it myself, but not much. We have colored gold and made it fairly successful for fillings. Now, why should we not be working along the lines of colored gold for crowns? We can take alloys as low as eighteen in the mouth, and that gives us six grains in a penny-weight to work on for the change of color. And while platinum makes gold hard, we can, perhaps, in working with some other metals, metals that may not be in use in dentistry to-day, work along and get a plate for crown-work that is as successful as the colored gold that we now use for fillings. Of course, the jewellers have all sorts of colored golds, and there are recipes for making and treating them. They are not for us, but they may furnish a suggestion for the next original worker.

With regard to the straightening of teeth in old age, the correction of irregularities, I referred to a case, I think, at the time Dr. Decker was here where I lifted out the whole six front teeth of a lady who was considerably over forty.

I do not think there is much more that I can add, excepting the pleasure that we all feel in New England in having a representative of the South, or the nearly South, among us this evening.

Dr. Clapp.—Mr. President, I think if there is any one thing that we admire it is an exhibition of courage, and if there is anything in this world that requires courage, it is for a busy dentist to attempt just this sort of work Dr. Smith has shown us.

It will be necessary for the correct understanding of his paper to have the models reproduced, and I understand it will assist our Editor considerably if he has authority to expend money in the reproduction of these models, and I therefore move that the Academy appropriate a sufficient sum for the illustration of the paper.

So voted.

Dr. Fillebrown.—There is at least one other member here whose conscious or unconscious cerebration always produces something worth while, and if we do not get the benefit of it, it will be

just so much clear loss. I suggest that Professor Brackett tell us what he has been thinking about.

Dr. Brackett.—Mr. President, one or two things I will say: first, to express the gratification that we all have felt in listening to the paper; second, to set up something which the essayist did not mean, and then object to that something.

In the sense that the essayist intended, I suppose I am in accord with his sentiment that the patient should be as “clay in the hands of the potter.” In another sense, which he probably did not mean, I should object to that. I think it is very profitable for the practitioner to listen to the patient’s suggestions. I remember our friend, Dr. Henry J. Bigelow, the surgeon whose attainments commanded the admiration of the surgical world, saying that every man knows his own geography best. It is true that patients, as they dwell upon their own embarrassments, their own sufferings, or their own needs, do gain in some particulars in multitudes of instances a better acquaintance with their defects and their needs than does the practitioner in a briefer inspection. Perhaps I am not up to the standard of the average dentist in attainment or alertness to see, but I have been many times very greatly profited by hearing that which the patient suggested. I have sometimes thought, without ever having had any positive statement to that effect, that the custom which I believe obtains in medical practice in consultations, of letting the younger and more inexperienced practitioners speak first, was of advantage to the older and presumably abler men who spoke after the suggestions of the supposedly less competent men had been heard.

So, without any spirit of criticising that which the essayist did not mean, I think there is in this which I have expressed that which has been profitable to me in my practice.

Dr. Werner.—I would like to ask the essayist whether he retains these regulating fixtures with cement or gutta-percha while the regulating is going on?

Dr. Smith.—It is set with cement usually. The only appliance that has been presented was set with cement.

Dr. Werner.—I should think it would be absolutely necessary: it would be wholly unsafe without.

Dr. Smith.—Mr. President, I only want to say that I cordially appreciate your kind words and am touched with a sense of your brotherly love in saying them. I have had nothing but admiration

for this august and learned assembly since I have known of its work. I have read your proceedings, and have felt that your influence was great in shaping the practice and morals of the profession, and I almost feared to present the subject-matter of this paper before your body. When we know the history of the organization, when we know what you have been doing, when we know that you have had men of ability, of reputation, before you, and know the class of work which you have done, it does seem a little tame to go back and rake up such a trite matter as I have brought to you.

And still I confess to you that I had it on my conscience that what has been said should be said. I have had it driven home to me quite recently. I had my boys come home for their Easter holiday, and they brought with them four students in a preparatory institution. One of them was the son of a physician, a specialist, a man of reputation and ability, of position and wealth. I could but notice that his expression was marred by the presence on the left lateral incisor of a gold crown. The first bicuspid on the right was crowned with gold, and two extensive contoured gold fillings were in his mouth. He was a Baltimorean. Another boy was from New York. His mouth was quite as unsightly, with an altogether unnecessary display of metal, one gold crown and large contour fillings.

Last week we had an assembly of Congregational ministers in our town, and two of them stopped at my house, one of them a charming man, a graduate of a university, a man whose very smile, if you could catch it without the marred effect of the presence of gold, would have been most contagious and most delightful. Even my wife, who perhaps might be placed in the position of a layman, one who does not think so much of these things, was struck with the revulsion which I could not but show when he smiled. He had a gold crown on the right first bicuspid and large gold fillings. He had no beard nor moustache, a clean, nice man, who took the utmost care of his person, dress, and manners, and still by the hand of a brother dentist he was marred. Should this thing exist?

I visited some folks here in Boston. I did not expect to find anything like that in Boston, but I have been around a little bit to-day, and I was introduced to a gentleman of position, of learning, a graduate of your University, a man of culture and training. What did I see in his mouth! He must have been in the hands of a dentist—not here, I hope.

These things, gentlemen, stare us in the face. Is it too late to go back and say that this practice, which I contend is barbarous, must be revolutionized? Is it too early to say we have outlived such practice—we do not do it now? Maybe *we* do not. Some people *do*. It is our business to see that they do not. Let us see if we cannot stop it.

Dr. Fillebrown.—I am sure, if I was situated differently this evening, I should be glad to occupy some minutes; but the time is passing, and we have others to hear from, and perhaps we had better entertain a motion that we now pass the subject.

Subject passed.

Dr. Fillebrown.—Ages ago, I believe, there was a company of men that started with their faces towards the East, and they were following the star in the East. To-night, I am happy to say, the conditions are reversed, and the star from the East has come to us. I am happy to introduce to you Dr. Chilcott, of Bangor, a member of the Board of Registration of the State of Maine, who will have a word for us on the use of silver-foil in dentistry.

(For Dr. Chilcott's paper, see page 690.)

DISCUSSION.

Dr. Chilcott.—Mr. President and Fellows of the Academy, when I was considering this paper, I hoped I really had something to say, but when I tried to put it on paper in my homely way, I was chagrined to find that, after all, there was not much of it.

I have asked permission, and obtained it, from the Chairman of the Executive Committee to say a word about cuspidors. You know, if your experience has been anything like mine, that it is not easy to find a sightly, nice, clean cuspidor, one that will remain so, even with care, that you can use in your office. I nagged our local crockery man until I was pretty well ashamed of it, although he took it very pleasantly. He had my order on his list for two or three years. And finally he said it was no use; he knew what I wanted, but he could not get it, as it was not made. In looking about I found some glass rose-bowls, like the one I have here, and am using one of them in which I keep a little clean water. I should like it better if it had a wider rim, but that is all there was on it. The comments which have been passed on it by people of refinement have been decidedly pleasing.

Dr. Taft.—How do you place it at the chair?

Dr. Chilcott.—It will go in the bracket at the side of the chair which is made for that purpose. A White's bracket is the one I happen to be using; it goes all right in that. The bowl is rinsed out when the patient leaves the chair and returned to its place perfectly clean.

Dr. Meriam.—It is, of course, made by some glass manufacturer?

Dr. Chilcott.—Yes, they are imported goods, being of a Bohemian make, but the glass-blowers are very obstinate, and while they will make a million all right enough, they will not take a small order.

Dr. Fillebrown.—The subject is now open for your consideration, remarks, criticisms, queries, or otherwise.

Dr. Brackett.—Mr. President, I would like to ask three questions: first, Where is this silver-foil obtainable? second, Is it feasible to have it of greater thickness, and, if so, is that an advantage or a disadvantage? third, What advantages does it possess over tin-foil?

Dr. Chilcott.—The only place I know of where it can be obtained is from Hynson, Westcott & Co., Baltimore.

I do not know why it would not be practical. I wrote to them and asked them, in filling an order, if they would not send me some that was heavier. I got no reply; the foil all came that thickness.

I think in many ways it has an advantage over tin-foil, for the reason that it oxidizes more readily, and that for the filling of pulp-canals it can be carried to the apex with less irritation. I have filled a good many teeth with the non-cohesive gold-foil, first filling the cavity partly full of tin-foil, but I do not know that this in those cases would have worked any better.

Dr. Taft.—I would like to ask the essayist what the foil is generally used for as made in this way?

Dr. Chilcott.—This foil was designed as a dressing for wounds, as I understand it, that were considered to be surgically clean; instead of covering them up with a pad of cotton or the surgeon's gauze, they put a few layers of this over the wound, and this young student at the medical college says they have most excellent results with it, for it certainly has a germicidal effect, and they get an adhesion by first intention with this oftener than with other methods.

Dr. Werner.—Does your experience show you that it does discolor tooth-substance?

Dr. Chilcott.—I have seen it where it appeared to discolor, but not in all cases.

Dr. Werner.—Does it infiltrate the tooth? Does it discolor the tooth itself?

Dr. Chilcott.—I have never used it where I would have a good chance to determine that. I have used it in soft, porous teeth, but they might possibly show a discoloration from something else. The discoloration I have seen in those cases I attributed to the silver-foil. I never had occasion to take any of it out, so I cannot tell you how far it penetrated the dentine.

Dr. Werner.—You know tin does not discolor tooth-substance, and we get the same germicidal effect, which is very likely due to the oxidation.

Dr. Chilcott.—I should feel that this would be more likely to discolor than tin. It certainly is more easily oxidized. I have seen tin placed in a tooth under a gold filling,—I have done it myself,—and it appeared to stain the tooth badly. Perhaps it did not discolor the tooth, but it would make the tooth look very dark.

Dr. Banfield.—Mr. President, I think it is wise for us to be cautious how we use any substance that will discolor teeth, particularly the front teeth, for, as I understand it, discolorations can be bleached when caused by vegetable matter, but not from metallic substances.

I will ask the essayist if he has seen any discoloration from the use of this silver similar to that caused by silver nitrate?

Dr. Chilcott.—No, not at all, so far as I have yet learned. It has not been in any of the teeth of my patients a great many months. But with the nitrate of silver you can see discoloration from it right off.

Dr. Meriam.—Is this lighter or heavier than the gold-leaf? I think it is about the same thickness. I think they advertise a gold and a silver leaf. I have occasionally found the greatest help and co-operation by going to smaller places where there was a man doing his own work. I remember that some years ago I was giving directions to Mr. Schmidt, in New York, and I noticed a gentleman there giving instructions to him in the making of a brace, and after he was through I spoke to him about one of my children wearing a similar brace. We talked on for some time, and he

noded his head towards Schmidt and said, "A good workman." And I said, "Yes, with the advantage of seeing him work." And he said, "Yes, that decidedly. I like to have my instruments made, if I can, where I can see my workman, and not buy them from a clerk at the shops." I think where the thing is nicely made and polished, and as attractive as it can be made to the eye in form, there is a natural feeling of the salesman, How can any one ask for anything better? But there may be some little difference in detail. It may be a matter of measurement, or the position in which one likes to stand at the chair, that makes it desirable to have that form of instrument; and for that kind of a thing the individual workman, if he take an interest, is a great help. In this making of foil, I have no doubt that with the co-operation of some old refiner we might get forms of gold that we never could get where we have to go to a clerk and it goes through two or three hands before it gets to the man who knows about it. If I were a manufacturer, I should keep my face towards my customer and keep the workman out of sight. I think it would be the natural tendency of business and trade. But as a practitioner, I like to know the workman.

Many of the men in Boston ten years ago took up the practice of going right to the shop and having the workmen make the instruments as they directed. I think they not only got their instruments, but they attained a larger intellectual development and a larger freedom, for any one who is working in this way, if he will secure the friendship of a good workman who knows about these things, he will give him with the greatest pleasure points in the matter.

It is the constant running out after something new and drawing it in that has made dentistry what it is. The growth of things is in keeping in touch with things outside of our profession as well as *in* it. And I think the essayist of the evening has done that, while I do not myself see the advantage of this over tin in any way. I remember some years ago I had very light tin made, thinking that I might get something better, but I found it was not. I think he may find that heavier foil than this will work. A man taking up a new thing like this and working it along, is working along a track that very likely will connect with something else, and in that way increase our resources and bring something of value.

Subject passed.

Dr. Brackett.—Under incidents of practice I wish to speak informally of the case I mentioned a month ago, where there was a question about the resection of the alveolus of the upper jaw that was projecting overmuch. It is intended to publish the case, but inasmuch as I mentioned it, I will say that the operation was very nicely performed by Dr. W. R. Howard, the dentist, assisted by Dr. R. E. Darrah, a general surgeon. An incision was made along the lower border of the alveoli from the centre of the cuspid socket to cuspid socket; the soft tissues, including the periosteum, were pushed back, and with sharp, bevelled bone-forceps there was removed the redundant portion of the alveolar process, a piece of bone very nearly a quarter of an inch in thickness extending from cuspid to cuspid. The remaining portion of the alveolus was dressed smoothly. Superabundant gum-tissue was cut back, leaving smooth edges of gum, which were neatly coaptated with a few catgut sutures, with the result that there has been perfect healing under the influence of the careful antiseptic treatment that was adopted throughout. Upon Monday of this week impressions were taken for the making of artificial teeth with the embarrassment of the projecting process entirely removed. The result is a decided success.

Dr. Baker.—I would like to ask Dr. Brackett, Would not the same result have been obtained if the anterior portion of the alveolar process had been excised? Would not that have been much easier?

Dr. Brackett.—That is just what was done, the excision of the anterior portion of the alveolar process, the actual cutting away of that portion of it which was not desired and which made the deformity.

Dr. Baker.—I understood from what you said that the bone behind the palatal surface of the teeth was excised and the alveolar process forced back.

Dr. Brackett.—Oh, no! An incision was made through the gum from cuspid socket to cuspid socket, the soft tissues were laid back, the projecting portion of the alveolar process was removed, and the gum put back in shape.

Dr. Clapp.—Had the teeth been long extracted?

Dr. Brackett.—The teeth had not been very long extracted.

Dr. Fillebrown.—They had been extracted long enough for the cavities of the sockets to be obliterated?

Dr. Brackett.—Not wholly. The operation of extraction—the original operation, I should suppose from the appearance of the case—had not been very many weeks before the operation on the process.

Dr. Fillebrown.—Perhaps if the expression were used that the periosteum was removed and the tissue lifted up, it might be applied to the palatal side, but in this case the lingual surface was lifted up, and then the anterior process was removed.

I had some knowledge of the case by correspondence beforehand, and so speak of it somewhat familiarly. That is the method that I have pursued in a number of cases. One was a case of the under jaw where the process had been too prominent. Just open the gum, break off the process, and let the gum lie back, and it heals down and makes a perfect bearing on an artificial denture.

The motion is made and seconded that the essayists of the evening receive the thanks of the Academy for their attendance and interesting papers this evening, and that they be requested to furnish a copy for publication.

So voted.

Adjourned.

CHARLES H. TAFT, D.M.D.,
Editor American Academy of Dental Science.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

REPORT OF THE FOREIGN RELATIONS COMMITTEE FOR THE YEAR 1900-1901.¹

THE past year has been an exceedingly active one for the Foreign Relations Committee, and the correspondence has been very large. We believe that the influence of the National Association of Dental Faculties has been materially extended during the year, and the good work that has been accomplished by it is becoming more widely known both at home and abroad.

The Association has given its Foreign Relations Committee

¹ Reported and adopted at the eighteenth annual meeting, held in Milwaukee, Wis., August, 1901.

jurisdiction in all foreign educational affairs that affect its interests. This we do not understand to mean that we can dictate what shall be the foreign policy to be followed, but that the committee may advise during the interim between the sessions, reporting its action for approval or disapproval at each annual meeting. This does not in any way interfere with the duties of the Ad Interim Committee, as the authority of the latter has never embraced matters in foreign countries. At the last annual meeting the committee presented a partial schedule of equivalents to be given for attendance on foreign courses of study. The Association accepted that and enacted that advanced standing in American schools should only be given foreign students in accordance therewith.

There is a rule of the Association that any legislation vitally affecting the members shall not go into effect for one year. This is a wise restriction, for the announcements are usually issued before the time of our annual meeting, and enactments that might be in conflict with the terms legally offered to students could not well be enforced. Your committee found that some foreign students had already been accepted by schools, and consideration given to foreign instruction which might be in conflict with the new regulations. It was therefore deemed best not to give any rulings affecting the annual term for 1900-1901.

But many loyal schools, those whose governors were most anxious to improve the standard of American professional education, have referred all their foreign applications to the committee. In this way it has been learned that foreign students have asked for advanced standing because of attendance, in some instances, on schools that had no existence whatever. Certificates have been presented from countries which have no dental legislation, and in which there is no semblance of a dental educational institution. They usually emanate from some private practitioner whose office is made to assume a sounding title. In other cases they pretend to be granted by some teaching hospital which has no official status.

Your committee has discovered that it is usual for the possessors of such doubtful credentials to write to a considerable number of schools to learn which, if any, will accept their certificates, and to find out whether some institution will not offer a special inducement. Each dean is assured that others will receive the applicant if he does not. The result is that all of those to whom application has been made are duly informed of the qualifications of suspected

students and the probable terms on which they were accepted if the name is found on the lists of any school.

By this it is readily perceived how deans of colleges have been deceived in the past, and how the character of our American schools has been made to suffer for things over which they had no control. The Foreign Relations Committee is prepared to recommend a rating for any foreign school that will submit its curriculum of study and its preliminary requirements of education. This must be approved by the Association before becoming effective, and if our schools will govern themselves accordingly the old reproach that we give advanced standing on insufficient qualifications will be forever removed.

A very few schools have manifested some opposition to these regulations. Your committee has, even by some inconsiderate teachers, been accused of an attempt to dominate the colleges. We cannot conceive upon what grounds such a charge should be brought. The committee has done nothing save that which it was positively instructed to do. It has made no rules whatever. It has confined itself to recommending such legislation as it believed absolutely essential to the proper conduct of an educational institution, and if such recommendations have been given legislative enactment, it has tried to carry them into effect, but not otherwise. It has never exceeded its authority nor been unnecessarily aggressive in any of its proceedings. If there exists any reason for criticism of its action on other grounds than opposition to wholesome restraint and the desire to do that which of right ought not to be done, it will be very glad to have such instances pointed out, for its sole ambition has been to carry out the honest wishes of the parent body to which it is responsible.

FRADULENT DENTAL DEGREES.

Last year, at the request of the committee, it was relieved of the task of endeavoring to suppress illegal and fraudulent degree-granting institutions, but, as it was already identified with the work, we found that we could not detach ourselves from it entirely. Letters and complaints were persistently directed to us instead of to the Law Committee, to which the subject had been referred. Besides, the diplomas which were sold by the fraudulent schools, and the principal attendance upon those which had a legal existence, but which are unrecognized and unaccepted here, was chiefly in and

from foreign countries. Hence its consideration properly belonged to the Foreign Relations Committee, and we could not well refuse to receive the complaints and do what we could in the premises. In our last report we made public the fact that a number of the fraudulent institutions were suppressed and their conductors imprisoned. We hoped that this would practically close up all of them, but special circumstances have intervened to protect certain ones, and the work is not yet completed.

It is not generally known in this country that thousands of fraudulent diplomas have been sold abroad. Were it possible for foreigners to distinguish between the reputable and the disreputable schools, this would not so much matter, but the statutes of the State of Illinois, under which it is possible to incorporate degree-granting institutions which have practically no State supervision or responsibility whatever, and which with legal sanction are, under the great seal of the State, certified as lawfully organized colleges by the Secretary of State of Illinois, simply encouraged the fraud. By that certification of the Secretary of State the most unblushing impostures are placed apparently upon the same plane with reputable institutions, and foreigners are deprived of all means by which they can positively determine which is worthy recognition and which is not. As a consequence, some foreign governments have used this condition, either honestly or as a desirable pretext, to discriminate against all Americans, and have refused them permits to practise, and positively prohibited under heavy penalties the employment by any one of the American degree or title. This interdiction is spreading very fast, and, unless something is done to forestall it, soon the possession of an American diploma, whether legitimately or illegitimately obtained, will be a positive detriment to a practitioner. In fact, that is the case to-day in some parts of Germany. The influence of such enactments upon American educational affairs and upon the members of this Association may perhaps be imagined. Already prohibition is practically accomplished in Southern Germany, is impending in Northern Germany, has been commenced in France, in Italy, and in other countries, and there is sharply threatened a combination of all Europe against the American dental degree and the American dental school.

Much of this may, with a considerable degree of justice, be charged against the State of Illinois. Its own legislation has

fostered the fraudulent schools that have brought this disgrace upon us. Its dental profession is not without responsibility. When has any body of its dentists put forth any special efforts to bring about a reform? The State has one of the best State dental societies in existence, with a large surplus in its treasury. For many years it has been a leader in thought, because within its membership has been found a great number of the very ablest men in dentistry; men who have done as much to advance dental practice as have any others. The papers read before that society have challenged the attention of the world. Many of the members must have known something of the opprobrious professional legislation upon the statute-books. Not a voice has been raised in denunciation of the condition. Not a word has been uttered, until at the last annual meeting a mild resolution deprecative of the infamous traffic was offered by one unconnected with either schools or boards.

The State Dental Examining Board of Illinois has practically recognized fraudulent and irregular colleges, schools either without any regular course of instruction or with but a very insufficient one, by admitting their students to the State examination and licensing them to practise, and by practically certifying to the regularity of institutions which every dentist in America knows, or should know, are conducted solely for whatever of revenue there may be in it. The law admits to the State examination for practice any one who asks for it, and the State Board of Dental Examiners has given the known fraudulent institutions a quasi status by admitting those holding their purchased diplomas to the examination, passing them, and giving them the certificate which makes of them regular and legal practitioners. This has been done under the law, but it is Illinois law, and the profession of the State is doing nothing to bring about a reform that professional decency imperatively demands. It is time that the many high-toned professional men of the State were aroused to the stern accountability to which they are liable to be called.

In directing attention to this, your committee must, in justice to the profession of the State, urge that in the opinion of some it has not been wise to admit that which has a real existence, in the hope that the State Board of Health and the medical profession might without scandal succeed in bettering the condition. Surely it must be now apparent to every one that the great work demands the most earnest efforts of every honest dentist of the State. The

excellent schools of Chicago have not hesitated to step into the breach when educational interests and professional progress were threatened by the action of other State examining boards. Why should they not attempt a reform in the State law under which their own board acts? ¹

Last year your committee was able to report that the worst of the fraudulent schools of Chicago had been closed and that their conductors were in prison. That which was done was to a large degree the work of the State Board of Health of Illinois, which brought suit under the United States laws that forbid the use of United States mails for fraudulent purposes. In no other way could the general government at Washington interfere, because in all educational matters each State is autonomous, that being one of the reserved interests not delegated to the general government. The Board of Health being a State institution, it could commence proceedings in the name of the State, and use State funds for the prosecution of the criminals. It has been appealed to by your committee to take up the fraudulent issue of dental degrees, but the following letter will show that it purposes to confine its labors to the suppression of the sale of medical diplomas:

“STATE BOARD OF HEALTH, STATE OF ILLINOIS, SPRINGFIELD.

“OFFICE OF THE SECRETARY, July 13, 1901.

“DEAR SIR,—Your letter of the 3d was received during my absence in the North. In regard to the sale of dental diplomas in Illinois. I cannot give you the letter you desire, for this board is taking no steps whatever to break up the traffic in these degrees. Through the efforts of this board

¹ Subsequent to the reading of this report at a meeting of the National Association of Dental Faculties, about three thousand dollars was raised within an hour for prosecution of the work of reform. The National Dental Association afterwards appropriated one thousand dollars more. Before the close of the Milwaukee meetings, however, the Illinois dentists in attendance actively commenced the work on their own account, and within a week secured the appointment of a new State Dental Examining Board, while a part of the old board were placed under arrest for malfeasance in office and for general fraudulent practices. Proceedings were also very promptly commenced to annul the charters of certain irregular or fraudulent schools, and the prospect is very encouraging for the entire removal of the reproach that has so long rested upon them, thus verifying the confident predictions of the committee, that when the profession of the State were fully awakened to the real condition it would without delay be purified as by fire.—B.

the sale and barter of medical degrees has been entirely suppressed, and the persons who formerly made a business of selling degrees in medicine are now in jail.

"With the assistance of the governor of the State and a few medical men we succeeded in getting legislation passed in 1899 by means of which it is a very easy matter to summarily close up any institutions selling degrees in medicine, dentistry, or pharmacy. Under this law the notorious 'Metropolitan Medical College' has been closed.

"There seems to be no reason why the State Board of Dentistry cannot take action in the matter of sale of dental degrees. If the board chooses it can suppress within two weeks the institutions the 'diplomas' of which are sold in Munich or elsewhere. Why this board has taken no action on these lines I am unable to say. The State Board of Health sees no reason why it should assume duties which devolve upon another board. If any medical degrees are sold in this State, I am not aware of the fact. If proof of such sale be presented to this board, the institution or institutions in question can be closed within a month.

"Very truly yours,

"J. A. EGAN,

"*Secretary.*"

It may thus be seen that we are thrown upon our own resources in the work of closing the institutions engaged in granting fraudulent or irregular dental degrees, and can look to the medical profession for no assistance. Your committee feels confident it can within a short time close up the last of the fraudulent schools if a sufficient sum of money can be placed at our disposal, and we are so advised by very competent legal counsel. We are prepared to submit a plan of procedure to this Association.

AMERICAN EDUCATIONAL AFFAIRS IN EUROPE.

During the past year professional events in Europe having relation to American educational affairs have crowded upon each other's heels in rapid succession. Partly as the result of the appointment of the Foreign Advisory Committees by the Association, and more especially through the action of United States governmental agents abroad, an attempt has been made to stem the tide which is so unjustly setting against us in Europe. The papers relating to such action were promptly sent to your committee. We recognized the fact that the purification of the stream must commence at the fountain-head. Practically no fraudulent degrees are sold in America; the countries of Europe are the sea into which the foul tide empties, and the sweetening of the waters cannot be effected there. It is in this country that the remedy must be

applied, and until a healthy public and professional sentiment can be evoked here nothing can be done. The condition has existed for years, and it is constantly growing worse. A pest-hole cannot be cleansed until it is uncovered. A festering wound must be laid open that access can be obtained to its foulest depths. The community must be convinced from whence an infection proceeds before it will abolish the source. Few dentists are aware of what exists in this country. Any man knows that when the honest intelligence of our profession is fully awakened to any enormity, it will move heaven and earth if necessary to put an end to it.

Your committee seized upon the opportunity of the presentation of the most damning proofs coming from official sources to show to the dentists of America what really existed in their midst. Nine out of ten of them had little conception of the condition. When your committee, in its annual report for the year 1898, presented at Omaha, in part laid bare the grossness of the traffic in dental diplomas, the statement was received with incredulity. When that report had been softened in some of its expressions because a part of the committee feared it was exaggerated, it was even then a matter of amazement, and in no place more so than in the State of Illinois. But when inquiry revealed the fact that the half had scarcely been told, the deepest indignation was expressed. All the best of the general educational institutions of the State combined to bring about reform. In their wrath and righteous exasperation they went before the Legislature, and met with defeat, because their statements were disputed and their motives impugned by the men whom they attacked. They had no fully awakened public sentiment back of them. Very few were aware of the enormity of the fraud. Their facts were met by counterbalancing statements on the part of men whose honesty had not before been impeached; a flank movement was successfully manœuvred; they themselves were accused of improper motives, and the Legislature refused to act. Then an attack was made through the United States courts, which were not under the influence of public opinion, and they succeeded in breaking up a part of the iniquity and in getting through an amendment to the law under which it is possible to annul the charter of an openly fraudulent college. But new charters were easily obtained by the same men, and the work was recommenced under another name. The snake at best was scotched, and not killed. The time for another awakening seemed ripe, and your

committee applied to the Secretary of State of the United States at Washington for permission to publish the official reports made to it by Consul Worman, of Munich, Germany. We believed that such publication, under the high sanction of the United States government, of official documents would challenge the attention of American people and greatly tend to produce a public sentiment powerful enough to sweep the fraudulent colleges from the face of the earth. Will it be believed?—from high places came public criticisms and protests against any open attempt to break up the infamous traffic which had seriously involved the reputation of every American school!

The name of Consul Worman has been mentioned. Your committee believes that his efforts to rehabilitate the American degree in Europe have been, and promise to be, of the greatest benefit to dentistry, and his work should be sustained by every one. Your committee has not been able to give him all the assistance it desired, because it was this year without the credit upon the treasurer of the Association that has been accorded it in the past, but it hopes that the good work may not be hindered by this obstacle in the future. Our national, our professional, our individual reputations are at stake. The good name of every member of this Association is in the balance, and our vindication from a foul blot upon our professional escutcheon must not be a matter of indifference. To assume that this is in the interests of antagonistic foreign governments, that it is doing their dirty police work, is to attempt to cover up and apologize for and justify the villany that is being done in our names; to assure complicity with the men who are trading on our good deeds, and who under cover of the high reputation of American dentistry, won by us, are endeavoring to foist upon foreign communities a counterfeit that must of necessity throw doubt upon the original.

FOREIGN DENTAL SCHOOLS.

In the face of the fact that a most determined effort is being made in some foreign countries to break down the reputation of American dental schools, and to discredit all American professional education, and in the knowledge that not only are our courses refused any consideration, but sometimes made a pretext upon which to forbid Americans to enter upon practice, this Association cannot be accused of illiberality or of professional narrowness should it

decline to accept foreign qualifications as a sufficient warrant for practice in this country. There should be some kind of reciprocity in professional affairs, and Americans ought not to be expected to extend all the professional courtesies granted. And yet, exact justice might, in the minds of many, demand that, irrespective of what may be done to us, we should be forgiving, and in return for the buffetings that we receive humbly expose the other cheek to the smiting hand. That course is perhaps highly Christian, but it is not quite in accordance with the impulses of an ordinary human nature. The man or the school that does not have sufficient of self-respect to maintain inalienable rights can scarcely expect to receive the consideration which may be honestly due.

But were this the only reason to be urged against the unquestioned acceptance of all foreign qualifications, we might justly be called churlish and professionally illiberal were we to exclude any one who asked our recognition. America was the first to establish any system of dental education. It embraced a full course of instruction, the whole of which must be covered within the walls of a duly chartered institution devoted to dental instruction. It was provided that all work leading to our special degree must be done under the direct supervision of qualified and accepted teachers. Recognizing the prosthetic department as one of the most important in dental practice, we insisted that it must have a scientific basis, and not be a matter of mere empiricism. We established the principle that our students must be under the pupilage of one who was acquainted with mechanical laws, and that the teaching of physical science should not be intrusted to possible charlatans. The instructor in mechanics must be responsible to the authority which granted the diploma or certificate of qualification.

The opposite course was pursued in founding the dental system of education in some other countries. Recognizing that many skilful mechanics were outside the pale of the fully qualified men, they practically excluded prosthetics from the college curriculum, classed mere mechanical skill as handicrafture, and permitted its instruction to be received at the hands of irresponsible men. They established a system of apprenticeship which in a manner bound out the student to a dental mechanic, who should give him instruction in one of the most important departments of dentistry. It could not be expected that we should accept such instruction as the equivalent for our full college courses. This condition was the

most embarrassing question that came before your committee in the attempt to establish a system of equivalents. Our schools refuse to give to an American student any advanced standing for time spent in the laboratory or office of a practitioner who has not teaching experience and responsibility. The matriculant may have passed years in a dental office, but he must join the Freshman Class on entering our colleges. Our diplomas or certificates are only granted upon the completion of a definite scholastic course. Occasionally some one has urged that merit and knowledge and skill should be recognized wherever found, and without reference to their source. But that is the very pretext urged by the fraudulent and short-term schools for the granting of their honors after an incomplete course, they themselves conducting the examination, and being the sole judges of that skill and merit.

Why American colleges or college men should desire to shorten the usual term is past comprehension, for it is prejudicial both to their educational and their financial interests. A degree is granted as a reward for the completion of a full course. It is not a recognition of merit. No two men reap the same advantages from a given amount of instruction. One man graduates a skilled, dexterous practitioner, while another is much his inferior. But both have earned their diploma by having successfully completed a prescribed course of study. Many men in the profession do not comprehend this, and blame the schools because a graduate is not as clever and expert in his technical manipulation as the experienced practitioner. Our schools demand the successful completion of a definite course in mechanics. We cannot recognize the qualifications of any man who has not complied with a reasonable requirement that is demanded of our own graduates. We cannot accept the course of any school that does not require this, and your Foreign Relations Committee has not recommended as the equivalent for ours the certificates of any such schools. The most that we can do for those that accept the apprenticeship system as a part of their course is to give one year's advanced standing for the completion of a full and complete three or four years' pupilage with final graduation.

Under our present legislation it is illegal and irregular for any member of this Association to admit to its Senior Class any student who has not at least the following qualification:

Successful completion of two full terms in a dental school

whose course has been accepted by this Association as a full equivalent for its own, and who shall by that school be recommended for such advanced standing.

Admission to the second or Junior Class of any of our schools can only be permitted to those who have one of the following qualifications:

(1) Successful completion of one full term in a dental school whose course has been accepted by this Association as a full equivalent for its own course, the student being by that school recommended for such advanced standing.

(2) Successful completion of the full course of some regular and duly accepted medical school, and graduation with the degree of Doctor of Medicine.

No partial courses are accepted, nor those spent in a school not fully and definitely recognized by this Association. Surely we cannot grant more than this to those making application from foreign countries while denying it to our own people.

This principle has governed the Foreign Relations Committee in making its recommendations for the recognition of foreign schools. There have been urgent requests for such recognition, but your committee has not felt itself at liberty to recommend what is not granted to our own schools and people. If any foreign school will demonstrate that its curriculum of study is the full equivalent of our own, and that it has complied with the statute of minimum requirements established by this Association at its last annual meeting, your committee will be prepared to examine its claims and to recommend such action to this Association as the course of study seems to warrant.

Your committee, in conclusion, points with no ordinary pride to what has been accomplished within the past five years as the result of an attempt to regulate our relations with foreign schools and foreign students, and to the high professional ground on which we now stand. There should be no further complaints, on the one hand that we accept unqualified men from abroad, or on the other that foreigners can come here and, without going through the full course demanded of American students, carry off our honors and claim to be American dentists, the colleagues of those who have completed our full curriculum of a broad course of dental study.

The foreign advisory boards, appointed with the approval of this Association, have proved to be useful auxiliaries in the carry-

ing out of our system of education. In Europe they have completed an organization, and will henceforth work together in harmony. They must exercise an important and wide influence in educational affairs, and their action cannot but be good. They will guard the interests of those holding the American degree, and help to prevent it from being unworthily conferred. Your committee has made some further appointments in countries heretofore unrepresented, which it reports for approval. It is very much to be desired that at each of our annual meetings representatives from these foreign advisory boards should be in attendance whenever possible, and we recommend the enactment of a standing resolution giving to such regular representatives a seat in our meetings with the usual privileges of the floor.

REPORT CONCERNING FOREIGN EQUIVALENTS AS AMENDED FOR THE
YEAR 1901.

Were your committee to follow the precedent set by most foreign countries no consideration would be given to their qualifications. Although America set an example to all the world in establishing a definite curriculum of instruction for dentists, in organizing schools for their theoretical and practical training, thereby erecting into a recognized profession or specialty that which previously was mainly empiricism and charlatanry, no official recognition of its special curriculum has ever been given by the dentists of foreign countries, although in great numbers they have attended our schools to obtain the advantages offered by that curriculum.

Your committee believes it to be neither fraternal, professional, nor just to adopt the same course, but thinks it both expedient and right to extend proper recognition to whatever can be received as an equivalent for our own courses. It must not be forgotten, however, that the system of dental instruction in Europe varies very widely from that of our special American schools. Instruction separate from that afforded by the medical schools or universities is very rare, and the practical training which forms a part of our curriculum is usually given by private preceptors. Your committee does not feel at liberty to recommend the acceptance of an oral and theoretical course as the equivalent for one including practical work. We cannot believe that the certificates of private and irresponsible practitioners can by us be accepted at any part of a college course, and hence we have given them little consideration.

Australia.

A very complete report from the various colonies of Australia and New Zealand has been made by the advisory board appointed for those countries. It would appear that in most of the colonies there is no dental legislation, but Victoria has lately secured a law analogous to that of England, and in Melbourne a dental school has been organized whose curriculum, from the partial syllabus furnished, seems to be a comparatively broad one. The institution has been but recently established, and your committee has been unable as yet positively to determine whether in all respects it complies with our minimum requirements. When this shall have been definitely determined, we shall be prepared to recommend to this body some proper action.

In the provinces of Western Australia and Tasmania no dental legislation has been secured.

There is a dental law in New Zealand, and the member of the advisory board from that province has furnished your committee with an abstract of it. There are no dental schools in the province.

Switzerland.

This is a republic analogous to our own country in some respects, the federal union being composed of separate cantons. There are some excellent universities which offer certain facilities for dental study, but their practical instruction, we believe, cannot be accepted as an equivalent for that offered by American dental colleges. Your committee recommends that holders of the Swiss national diploma be given one year's advanced standing in the schools of this Association, but that no consideration be at present extended to holders of the cantonal qualifications.

Spain.

The Spanish requirements in medicine are very high, but your committee has not learned that there are any dental schools, or dental departments of universities, whose course of instruction can be accepted as the full equivalent for the instruction given in American dental colleges.

France.

In accordance with the recommendations of the advisory board for this country, your committee recommends as follows:

That one year's advanced standing be given to students possessing the French government diploma of "Chirurgien Dentiste" who have completed the three years' course in either the "Ecole Dentaire de Paris" or the "Ecole Odontotechnique," and that the same consideration be given the French diploma of Doctor of Medicine.

That in all cases the American preliminary examinations as to educational requirements be demanded, and that a sufficient acquaintance with the English language to enable the student to comprehend lectures be an essential.

Germany and Austria.

Your committee recommends that students speaking the English language, who have taken the full dental course in German or Austrian universities, be eligible for reception in the second-year classes of American dental colleges, provided it be shown that they have had at least two semesters of competent college instruction in practical laboratory and operative work.

Italy.

There are, we believe, no schools in Italy which have courses that can be accepted as equivalent to those of our American dental schools. The instruction given in the medical schools your committee believes to be too exclusively general in its character to form an acceptable course in dentistry for American students.

Holland and Belgium.

In these countries the title of dentist is obtained by passing a practical examination in the theory and practice of dentistry. There are no separate dental schools, and we are not sufficiently informed of the comprehensiveness of the syllabi of the universities to offer any recommendations concerning them.

Great Britain.

Your committee recommends that all students who shall have finished the complete course in any recognized English, Irish, or Scotch dental school or hospital, shall be eligible for reception as second-year students in American dental colleges upon proof of their having taken as a part of such foreign course two years of instruction in a properly equipped dental laboratory and dental

infirmary connected or affiliated with such dental school or hospital, and which requires the successful completion of the work deemed essential by recognized American schools, as formulated in the minimum requirements for foreign dental schools accompanying this report. We further recommend that for the present no consideration be given to partial courses in any of the dental schools of Great Britain.

Denmark, Sweden, and Norway.

Sweden has one dental school, which is the Dental Department of the Caroline Medico-Chirurgical Institute of Stockholm. Instruction is given by five professors of the Medical Department, and there are three dental professors, occupying respectively the chairs of Dental Surgery, Operative Dentistry, and Dental Prosthetics and Orthodontia. From the assurances given, your committee believes that its graduates should be permitted to enter the second-year class of recognized American dental colleges, provided they shall have complied with our requirements concerning mechanical laboratory work.

Your committee has not sufficient knowledge concerning any school in Denmark or Norway to warrant further recommendations at present.

Japan.

There is one dental school in Japan. It confers no degree, but gives a certificate which entitles the holder to government examination, the same as if he had studied with some practising dentist. As the instruction is personal and the school is quite irresponsible, your committee believes that no consideration can be given to those completing its courses.

Mexico.

There is a medical school in the City of Mexico which purports to give dental instruction. Your committee cannot learn that it is of such a character as will enable it to be accepted as the equivalent for a course in an American dental college.

Canada.

There is but one school in the Dominion, so far as your committee is aware, whose courses can be accepted as an equivalent for those of our own colleges, and that is at present a member of this body, so that it requires no special ruling.

Other Foreign Countries.

Concerning the educational status of other nations, your committee is not in possession of sufficiently definite information to warrant any action whatever. We have no knowledge of the existence of any courses of instruction which can be accepted as an equivalent for the courses in the institutions having membership in this body, and therefore advanced standing in our schools cannot in justice to our own students be granted save in the instances above enumerated.

REPORT CONCERNING MINIMUM REQUIREMENTS.

That a proper standard may be adopted by which the relative value of the courses in foreign dental schools whose students offer them as equivalents for a part of the instruction given in the colleges of the Association may be determined, your committee recommends the approval of the following as the minimum of requirements demanded:

1. The college must require of matriculants a preliminary education which is the full equivalent of that demanded by the schools of this Association.

2. The college must demand of students full attendance upon at least three full annual courses (not semesters) of lectures of not less than seven calendar months each in separate years, covering all the studies proper to a full dental curriculum.

3. The college must possess a bacteriological laboratory, with sufficient of equipment for instruction in a competent course in bacteriology, which must form a part of its curriculum of study.

4. The same must be required in chemistry, histology, and pathology.

5. There must be a technic laboratory in which shall be taught the proper manipulation for the insertion of all kinds of fillings for teeth, the preparation and filling of the roots of teeth, the tempering and shaping of instruments, the drawing of wire and tubing for cases in orthodontia, and the cutting of bolts and nuts.

6. There must be prosthetic laboratories sufficiently equipped for teaching all kinds of prosthetic work, and the construction of all the approved prosthetic appliances.

7. There must be a sufficiently equipped laboratory for instruction in making crowns and bridges, and the construction of appliances used in orthodontia.

8. There must be a properly equipped infirmary or surgery for the reception of patients, upon whom each and every student shall be required individually to perform all and enough of the operations necessary in dental practice thoroughly to qualify him for the successful pursuance of his profession.

9. Complete records of the work done by each student, of his attainments at sufficient and full examination in each subject of the curriculum of study, of his attendance and deportment during the course, must be permanently kept.

10. No credit must be allowed for any work not done under the immediate supervision of instructors connected with or especially approved by the college, and who are in direct affiliation with the faculty.

FOREIGN ADVISORY BOARDS.

The following is a list of the countries for which advisory boards have been designated, and the appointments and nominations so far as made:

COUNTRY.	NAME.	COLLEGE.	POST-OFFICE ADDRESS.
Great Britain.	Wm. Mitchell, D.D.S.	Univ. of Michigan.	39 Upper Brook Street, London, England.
Great Britain.	W. E. Royce, D.D.S.	Phila. Dental Coll.	2 Lonsdale Gardens, Tunbridge Wells, England.
Great Britain.	B. J. Bonnell.	.....	94 Cornwall Gardens, S. Kensington, London.
Holland and Belgium.	J. E. Grevers, D.D.S.	.....	13 Oude Turfmarkt, Amsterdam, Holland.
Holland and Belgium.	Ed. Rosenthal, D.D.S.	Harvard University.	19 Boul. du Regent, Brussels, Belgium.
Holland and Belgium.	C. Vander Hoeven, D.D.S.	.....	Der Haag.
Denmark, Sweden, and Norway.	Elof Förberg, D.D.S.	Phila. Dental Coll.	Sturegatan 24, Stockholm, Sweden.
Denmark, Sweden, and Norway.	S. S. Andersen, D.D.S.	Univ. Pennsylvania.	Christiania, Norway.
Denmark, Sweden, and Norway.	L. P. Vorslund-Kjaer, D.D.S.	Phila. Dental Coll.	Copenhagen, Denmark.
Russia.	H. V. Wollison, D.D.S.	N. Y. Coll. Dentistry.	10 Quai de l'Amaranti, S. Petersburg, Russia.
Russia.	Theo. Weber, D.D.S.	N. Y. Coll. Dentistry.	Helsingfors, Finland.
Russia.	Geo. Th. Berger, D.D.S.	Phila. Dental Coll.	St. Petersburg, Russia.
Germany.	W. D. Miller, D.D.S.	Univ. Pennsylvania.	Victoriastrasse 30, Berlin, Germany.
Germany.	C. F. W. Bodecker, D.D.S.	N. Y. Coll. Dentistry.	55 Unter den Linden, Berlin, Germany.
Germany.	Friedrich Hesse, D.D.S.	N. Y. Coll. Dentistry.	Goethe Str. 6, Leipzig, Germany.
Austria and Hungary.	Otto Szigmondi, M.D., Ph.D.	University Vienna.	Schmerlingplatz 2, Vienna I, Austria.
Austria and Hungary.	Rudolf Weiser, M.D., Ph.D.	University Vienna.	Frankgasse 2, Vienna, IX, Austria.
Austria and Hungary.	Dr. Jos. Arkövy.	Univ. Budapest.	Vaczi-utca, Budapest, Hungary.

COUNTRY.	NAME.	COLLEGE.	POST-OFFICE ADDRESS.
Italy and Greece.	Albert T. Webb, D.D.S.	Univ. Pennsylvania.	87 Via Nazionale, Rome, Italy.
Italy and Greece.	Tullio, Avanzi.	Nominated.	.....
Italy and Greece.	A. V. Elliott, D.D.S.	Univ. of Michigan.	10 Via Tornabuoni, Florence, Italy.
France.	J. H. Spaulding, D.D.S.	Univ. of Minnesota.	39 Boul. Malesherbes, Paris, France.
France.	George B. Hayes, D.D.S.	Univ. of Michigan.	Paris, France.
France.	G. A. Roussell, D.D.S.	N. Y. Coll. Dentistry.	74 Boul. Haussman, Paris, France.
Spain and Portugal.	R. H. Portuondo, D.D.S.	Univ. Pennsylvania.	Paseo de Recoletos 3, Madrid, Spain.
Spain and Portugal.	Florestan Aguilar, D.D.S.	Phila. Dental Coll.	Serrano 5, Madrid, Spain.
Spain and Portugal.	T. J. Thomas, D.D.S.	.....	Bilboa, Spain.
Switzerland and Turkey.	L. C. Bryan, D.D.S.	Boston Dental Coll.	St. Alban Anlage, Basel, Switzerland.
Switzerland and Turkey.	Theo. Frick, D.D.S.	Univ. Pennsylvania.	14 Tonhallenstrasse, Zurich, Switzerland.
Switzerland and Turkey.	Paul J. Guye, D.D.S.	Penn. Dental Coll.	12 Rue de Candolle, Geneva, Switzerland.
Japan, China, and India.	.....	.....	.....
Japan, China, and India.	J. Ward Hall, D.D.S.	.....	Shanghai, China.
Japan, China, and India.	.....	.....	.....
Australia & N. Zealand.	Alfred Burne, D.D.S.	Phila. Dental Coll.	1 Lyon Terrace, Liverpool Street, Sydney.
Australia & N. Zealand.	Dr. A. P. Merrill.	Phila. Dental Coll.	52 Collins Street, Melbourne.
Australia & N. Zealand.	Herbert Cox, D.D.S.	Univ. of Michigan.	216 Queen Street, Auckland, New Zealand.
Cuba & W. India Islands.	.....	.....	.....
Cuba & W. India Islands.	Rice R. Buchanan, D.D.S.	.....	47 San Francisco Street, San Juan, Porto Rico.
Cuba & W. India Islands.	A. E. Mascort.	Nominated.	Havana, Cuba.
Mexico & Cent. America.	H. W. F. Buttner.	Nominated.	City of Mexico.
Mexico & Cent. America.	J. W. Purnell.	Nominated.	Merida, Yucatan.
Mexico & Cent. America.	J. Hunter.	Nominated.	Puerto Cortez, Honduras.
Venez., Colom., & Ecua'r.	Manuel V. Toledo.	Nominated.	Caracas, Venezuela.
Venez., Colom., & Ecua'r.	J. R. Martinez.	Nominated.	Guayaquil, Ecuador.
Venez., Colom., & Ecua'r.	.....	.....	.....
Peru, Bolivia, and Chili.	Charles B. Davies, D.D.S.	Penn. Dental Coll.	49 Plaza Anibal Pinto, Valparaiso, Chili.
Peru, Bolivia, and Chili.	S. R. Salazar, D.D.S.	Chicago Coll. Dental Surgery.	Lima, Peru.
Peru, Bolivia, and Chili.	C. W. Sparrock, D.D.S.	Nominated.	Lima, Peru.
Brazil and Guiana.	J. L. Fordham.	Nominated.	Rio de Janeiro, Brazil.
Brazil and Guiana.	Julius Weinburger.	Nominated.	Para, Brazil.
Brazil and Guiana.	.....	.....	.....
Argentine, Para., & Uru.	J. S. Burnett.	Nominated.	Salto, Uruguay.
Argentine, Para., & Uru.	J. C. Macartney.	Nominated.	Montevideo, Uruguay.
Argentine, Para., & Uru.	.....	.....	.....

MEMBERSHIP OF THE NATIONAL ASSOCIATION OF DENTAL FACULTIES AT ADJOURNMENT, JULY, 1901.

The following is a list of the dental colleges of America which at the present time are members of the National Association of

Dental Faculties, whose diplomas and tickets alone are recognized and received by the members of the Association:

Alabama.—Birmingham: Birmingham Dental College.

California.—San Francisco: Dental Department, College of Physicians and Surgeons; University of California, College of Dentistry. Los Angeles: College of Dentistry, University of Southern California.

Colorado.—Denver: Colorado College of Dental Surgery.

District of Columbia.—Washington: Dental Department, National University; Dental Department, Columbian University; Dental Department, Howard University; Georgetown University, Dental Department.

Georgia.—Atlanta: Atlanta Dental College; Southern Dental College.

Illinois.—Chicago: Chicago College of Dental Surgery; College of Dentistry, University of Illinois; Northwestern University Dental School.

Indiana.—Indianapolis: Central College of Dentistry; Indiana Dental College.

Iowa.—Iowa City: University of Iowa, College of Dentistry. Keokuk: Keokuk Dental College, Dental Department of Keokuk Medical College.

Kentucky.—Louisville: Louisville College of Dentistry, Department of Central University of Kentucky.

Louisiana.—New Orleans: New Orleans College of Dentistry.

Maryland.—Baltimore: Baltimore College of Dental Surgery; Baltimore Medical College, Dental Department; Dental Department, University of Maryland.

Massachusetts.—Boston: Dental School of Harvard University; Tuft's College Dental School.

Michigan.—Ann Arbor: Dental College, University of Michigan. Detroit: Dental Department, Detroit Medical College.

Minnesota.—Minneapolis: College of Dentistry, Department of Medicine, University of Minnesota.

Missouri.—Kansas City: Kansas City Dental College; Western Dental College. St. Louis: Marion-Sims Dental College; Missouri Dental College, Dental Department of Washington University.

Nebraska.—Omaha: Dental Department, University of Omaha.

New York.—New York: New York College of Dentistry; New

York Dental School. Buffalo: University of Buffalo, Dental Department.

Ohio.—Cincinnati: Cincinnati College of Dental Surgery; Ohio College of Dental Surgery. Columbus: Ohio Medical University, Dental Department. Cleveland: Western Reserve University, Dental Department.

Oregon.—Portland: North Pacific Dental College.

Pennsylvania.—Philadelphia: Dental Department, University of Pennsylvania; Medico-Chirurgical College of Philadelphia, Department of Dentistry; Pennsylvania College of Dental Surgery; Philadelphia Dental College. Pittsburg: Pittsburg Dental College, Department of Western University of Pennsylvania.

Tennessee.—Nashville: Dental Department, University of Tennessee; Department of Dentistry of Vanderbilt University; School of Dentistry of Meharry Medical College, Department of Central Tennessee College.

Virginia.—Richmond: University College of Medicine and Surgery, Dental Department.

Wisconsin.—Milwaukee: Milwaukee Medical College, Dental Department.

Canada.—Toronto: Royal College of Dental Surgeons of Ontario.

WILLIAM C. BARRETT,

208 Franklin Street, Buffalo, N. Y.,

JOHN D. PATTERSON,

Ninth and Walnut Streets, Kansas City, Mo.,

TRUMAN W. BROPHY,

126 State Street, Chicago, Ill.,

M. W. FOSTER,

9 W. Fayette Street, Baltimore, Md.,

EUGENE H. SMITH,

283 Dartmouth Street, Boston, Mass.,

Foreign Relations Committee.

INTERNATIONAL DENTAL FEDERATION: FIRST GENERAL MEETING, HELD AT CAMBRIDGE, ENGLAND, 1901.

THE first meeting of the Federation was held in the Physiological Theatre, University Museums, on the morning of Wednesday, August 7, when the Federation was welcomed to Cambridge by the deputy vice-chancellor of the university, Sir Michael Foster, M.D., F.R.S., M.P., who said:

MR. PRESIDENT AND GENTLEMEN,—The vice-chancellor of the University of Cambridge is, unhappily for us, obliged to be away from the university at this period, and in his absence he has asked me to act as his deputy and to bid a most hearty welcome to this important International Dental Federation. I understand that its international character is assured by the participation in it of seventeen different countries, and I assure you that this ancient town feels it a compliment that you have chosen it as one, if not the very first, for your visit. The vice-chancellor trusts that your visit here will be both profitable and agreeable: that it will be profitable will rest mainly with yourselves; that it shall be agreeable we have done our best to insure.

The President (Dr. Godon).—Sir Michael Foster, ladies and gentlemen, permit me, in the name of my colleagues of the International Dental Federation, to thank the vice-chancellor and the members of the council of the University of Cambridge for the kind hospitality that has been tendered us in these ancient buildings, where generations of students and professors, many of whom have become illustrious, have succeeded one another. No place could be more appropriate for our labors than Trinity College, where the names of Newton, Roger Bacon, Macaulay, Tennyson, Dryden, and many others present themselves spontaneously to our minds to inspire us and to encourage us in the work of universal union and of international education that we have undertaken.

And no one is better qualified to receive us than Sir Michael Foster, the learned representative of the vice-chancellor of the university; Sir Michael Foster, the eminent physiologist whose name has become universally famous through his scientific work. He welcomes us to-day with the same kindness with which, as president of the British Association, he welcomed my countrymen

at Dover in 1899. In the name of the Executive Council of the International Dental Federation, and in that of the International Commission of Education, I beg to tender him the sincere expression of our gratitude and respect.

Sir Michael Foster.—Mr. President and gentlemen, the ancient university to which I have just had the pleasure of bidding you welcome, and which numbers among its illustrious men, in addition to the names which your president has mentioned, that of William Harvey, presents somewhat mediæval features which are lost to other universities,—features mediæval, but modified by modern development.

In the earliest days of the university every one who attained the title of Doctor thereby gained the right to teach. He, in those early days, taught in any room he could, in one which he hired for the purpose with his own scanty earnings, or in one which was granted to him by the benevolence of others. His pupils in like manner lived where they could, sometimes in such lodgings as their poor purse could secure, sometimes enjoying the hospitality of benefactors. In the course of time the university became able to make provision for its teachers,—if not for all its doctors, at least for those whom after a while it came to speak of as professors. The students, on the other hand, found it to their profit to gather together in common lodgings, which came to be called hostels.

In most countries other than England, while the provision made by the university for its teachers has enjoyed a large development and all universities have now their lecture theatre, their museums, their libraries, their laboratories, and their halls for solemn occasions, the hostels have for the most part been broken up and the students left to shift for themselves. In England, on the other hand, the country having been for centuries secure on the whole from invasion and war's destructive effects, the hostels have flourished more and more. In course of time, after in some instances a temporary connection with religious orders, they have developed into what we here call colleges,—institutions which are hostels in the sense that they afford lodgings for the students, but which do much more than this, in that, over and above what is done by the university, they afford teaching of a very varied kind, and moreover have entered into special relations with the university itself. Each college, in fact, is in many respects, in Cambridge, a small university within the mother one. Here at Cambridge we have

seventeen colleges, in addition to institutions which we consider as and call mere hostels, seventeen small universities having complicated relations with the university itself and carrying out much of the teaching,—performing, in fact, almost all university functions save that of giving a degree.

Such a state of things could not help leading to a certain rivalry between the mother and the seventeen daughters. The prosperity of the colleges was more or less inimical to that of the university, and indeed for many years the university, as distinct from the colleges, somewhat languished. During the last generation or so, however, it has undergone great development and expansion.

You are gathered to-day in a university which, like its sister university of Oxford, bears more distinctly than do most of the other universities of Europe the stamp of early and mediæval times, preserved by the predominance of the colleges. You may recognize this in the direction and respective relations of the studies carried on in the plan. In old times there were three faculties in a university,—Theology, Law, and Medicine, corresponding to the three pursuits which demanded at that time book-learning. For the university was founded for practical purposes, and only these three pursuits as yet needed book-learning; the soldier, the merchant, and the manufacturer could do without it. Later on there grew up a faculty of Arts for the protection and advancement of those more general studies which furnished an introduction to the three special practical studies. He who aspired to be a doctor of theology, law, or medicine spent much time in this common learning before he specialized for his profession. In the course of time the colleges took up with vigor this common learning, leaving the more professional studies to the university itself. Moreover, partly from the circumstances of their origin, their early connection with religious orders, partly from other influences, the colleges, and with the colleges the university, became more and more associated with the church, the Established Church of England. And, indeed, during the early and even the middle part of the past century the university and the colleges seemed to belong to the church. The university became the training-place for nearly all the clergy, and gave them all they needed, while some lawyers only, and even fewer doctors, sought its aid, and received there not a professional, but solely a general education. The last generation has, however, seen great changes. The ties with the church have been loosened, pro-

fessional studies have been encouraged, and in an increasing manner not clergymen, lawyers, and doctors only, but men of other professions and pursuits,—the engineer, the farmer, the man of business and commerce, the manufacturer, and even the soldier,—are knocking at its doors and seeking for professional as well as general education.

At the present moment you will find this university, like other seats of learning and education, busy with the question, What is the best kind of education for each profession and pursuit?—a question which is also stirring you.

All, I venture to think, are agreed that education should be fashioned after the manner of a cone, starting from a broad basis and narrowing to an apex, for it is the conical bullet that has penetrating powers. In the storm and stress of modern life an all-round education, such as makes a man a mental sphere, is not in itself adequate. Spheres move readily one over the other, and spherical education may be good in society, but it is not suited for a profession. The round ball thrown at a surface may make a hole, but more frequently simply rebounds; whereas the cone may be depended upon to pierce, and the man whose education is conical makes his way.

For each profession the cone should be different, should be fashioned in different ways, though in each case it should start from the same broad basis,—namely, the broad basis of the discipline of the school; that is, the boy's school. I say discipline rather than the learning of the school, for the aim of the school master should be in all cases the formation of the mind,—the setting of the instrument, not the filling of the bottle. The growth of habits of accuracy, of intentness, and of alertness, this rather than the gathering of mere knowledge of facts, is the proper heritage of the school, and for the attainment of these habits it matters not so much what the boy is taught as how he is taught.

From this broad basis of a general school education the narrowing of professional training begins, and we thus come to the question which interests us to-day; that is, the narrowing of training which is best for the dentist, and how shall it best be brought about? On this it would not be fitting that I should do more than offer a few general reflections.

The dentist is a healer; his business lies with a very small portion of the human frame, but that portion, though small, is still

human; it has its diseases, its failings, and the dentist has to cure these, bringing in, whenever it be possible, that best of cures, prevention. The training of the dentist is, in broad terms, the training of a healer.

I remember that in my young days a celebrated surgeon used to say that a surgeon was a physician and something more, meaning that he had to possess a general knowledge of disease such as the physician possesses, but had, in addition, not only to know certain features of disease which the physicians might neglect, but also to acquire a manual dexterity which the physician never needed. In somewhat the same way we may say that the dentist is a surgeon and something more. He has, like the physician, to possess a general knowledge of disease, and to possess, like the surgeon, a certain skill of hand; but besides this he has to acquire a special manual dexterity never called for in a surgeon, and to possess a special knowledge of metallurgy, of chemico-physics, and of branches of mechanics of which neither the physician nor the surgeon need know anything at all.

All knowledge is useful, but the power of the human mind to attain and retain knowledge is limited. We cannot all know everything. The surgeon need not, and, if he is to excel greatly in his art, cannot, know all the minutiae of the physician's calling; he cannot at once be an accomplished surgeon and complete master of all the details of auscultation and the intricacies of neural pathology. In like manner the dentist, if he is to excel in his art, cannot hope to know all that the physician must know and the surgeon must know. Such being the case, where shall we begin to narrow the education of the dentist? for narrow it we must. How are we to differentiate the training of this special healer from the training of the general healer, the physician or the surgeon?

The training of the doctor is partly general, partly special. His special training ought to be as full and as complete as possible; he cannot know too much, he cannot be taught too much of actual disease and of the various means to combat it. His general training stands on a different footing. The object of this is to enable him to understand and judge the special knowledge which he has to acquire, and though from one point of view no general education can be too wide, from the point of view of the demands of actual life that general education is sufficient which secures the above object and which adequately prepares him for the special

training which follows. The main elements of the doctor's general training are these: He must know general pathology, the nature of the processes of disease. This is the central element, the fundamental element, absolutely necessary for the understanding of the true nature of individual maladies, and time spent on this is time wisely and economically spent. Further, he must know physiology and anatomy, but there is no need to carry his studies in these farther than is sufficient to enable him clearly and fully to lay hold of the truths of pathology and the laws of health, and to impress on his mind such details of topographic anatomy as will always stand him in good stead in his practice as a physician or a surgeon. Lastly, he must know physics and chemistry, for without a certain knowledge of these he cannot understand physiology, and must remain really ignorant of pathology.

The dentist, like the doctor, needs a general as well as a special training. What can be said about the general education of the dentist? And when I say "dentist" I mean the scientific dentist, he who does his work not by mere rule of thumb, but in the light of scientific knowledge and under the guidance of scientific principles,—for it is with him alone, I take it, that we are interested here. What ought the scientific dentist to undergo in the way of general training?

I imagine that I shall not go far wrong when I say that, in common with the doctor, he ought to possess a general knowledge of pathology. He has to deal with disease, with disease of the teeth and, indeed, of the mouth, and he ought to be well acquainted with the general truths of pathology. He need not be carried farther into the details of disease than is necessary to enable him to understand general morbid processes and the common ways in which living structures go wrong. But he may with profit be led to spend some considerable time on that division of pathology which teaches how many of the ills that flesh, even the hardest part of it, is heir to are the handiwork of minutest organisms, are scourges laid on by invisible rods. What we now call bacteriology must, so far as it deals with disease, be an essential part of every dentist's training. Beyond this the dentist needs, like the doctor, such knowledge of physiology and anatomy as will enable him to lay hold securely of pathology, but in his case the details of the topographic anatomy of the body at large are not needed, and may fitly give place to a knowledge of the anatomy and physiology of

the teeth, more special and more complete than is ever needed by any doctor. Such a general training is one more or less common to both the dentist and the doctor. But the former has also need of a general—that is, of a preparatory—training wholly uncalled for in the case of the latter.

The days when the public mainly judged of the merits of a dentist by the celerity and freedom from pain with which he robbed his patient of possessions which could never be really replaced are long gone by. The art of the dentist is now pre-eminently a constructive and preservative art. And the dentist, if he is to succeed in construction, must know the nature of the materials which he constructs, and the physical, mechanical laws of the construction which he attempts. If, in order to grapple adequately with disease, he must share in the general training of the doctor, he must, in order to grapple with the difficulties of repairing the ravages of disease which he and others have failed to prevent, share in another general training of a wholly different kind. He must be inducted into some, at least, of the mysteries of metallurgy; he must have a scientific knowledge of the chemical and physical properties of the varied materials which he uses for construction, and he must learn something of what may be described as a special branch of engineering. He must be trained in ways and things wholly unknown to the physician and the surgeon. Moreover, if he is to hope to succeed in his profession, he must know the things of which I am speaking not only theoretically, but practically. Just as the young doctor begins his practical hospital duties by dressing wounds and acting as a nurse, as the general who commands armies has at the beginning to take his place as a private in barrack square drill, as the young engineer puts on his blouse to go through the workshop, so the young dentist must spend an allotted time at the bench.

Obviously the training of the dentist, much as there must be in it common with that of the doctor, must be narrowed in its own way if the cone of education is to be brought to an effective apex.

Doubtless the dental profession has much to gain in many ways by a close alliance with the medical profession. The position of being a branch of the great and powerful medical profession gives it advantages many and great, and it would be folly to cast away these advantages by demanding a divorce unless that divorce be really necessary.

One object, and one object only, ought to be the aim of the

training of a dentist,—to make him as sure and as efficient a workman as possible. If, as seems probable, in the rush of men and things, ordinary minds under ordinary circumstances cannot achieve that efficiency and at the same time pursue a complete medical education, then some separation seems inevitable. The separation, however, should not be a divorce, but simply a deviation or differentiation, a claim for a separate apex hand in hand with the acknowledgment of a common basis.—*Dental Cosmos*.

(To be continued.)

Editorial.

WHEREIN DOES DENTISTRY DIFFER FROM TRADE?

IN a recent article from the pen of one of the prominent members of the dental profession¹ the question was asked, "What is a profession?" The answer was given, "It is an aggregation of men who have been specially educated to do special work,—nothing more and nothing less." If this definition be correct it conflicts with the general idea of a profession which is clearly outlined by the Century Dictionary, as follows: "In professions, strictly so-called, a preliminary examination as to qualification is usually demanded by law or usage, and a license or other official authority founded thereon required." Worcester's Dictionary defines a profession to be "a calling; a vocation; an occupation; a business; office; employment,—especially an employment requiring a learned education, as those of divinity, law, and physics."

Our respected colleague, in his able review of dentistry as a profession and its connection with trade, evidently overlooked the wide distinction made by the Century that examinations, preliminary and final, are requisites as part of the process required to establish a professional vocation. While this may not be satisfactory to many, and may seem an altogether arbitrary distinction between classes, it does nevertheless mark a dividing line between all callings that require special scientific training and examinations to de-

¹ Safford G. Perry, D.D.S., New York.

termine the result and those departments of industry that demand years of practical training without the usual requirements of the professional schools.

The difference between the mechanic, tradesman, banker, etc., and the lawyer, doctor, civil, mechanical, and electrical engineers may not be distinctly drawn by the average mind, yet the difference is recognized; but this fact by no means rightfully establishes any claim to superiority of one class over the other.

There seems a natural tendency with some minds to regard all class distinctions as aristocratic in character and tendency, and are, therefore, not to be tolerated in this country. This view is, in the larger sense, true of the world as a whole, but these social separations as understood in monarchical countries have no place, and should have no place, in a republic; and yet there are spheres of mental environments that cannot be overstepped, even should the high and low respectively desire the change.

The writer can have no sympathy with the affectation of superiority assumed by some college-trained men over the practical man, the "mere mechanic." It is not a question of superiority in any degree. If this were so, then the positions would frequently have to be reversed, for the practical man, the man who creates, rises immeasurably superior, in the world's work to the man learned as the school-men. It is an unwise effort to attempt to create class distinctions in the great and multiplying work of civilization. The humblest worker has his place as well as the highest, all being parts of a complex whole, of which nothing can be lost without becoming a serious set-back to the world's progress. Following these prefatory thoughts, the question may properly be asked, What relation does dentistry hold to the trades closely connected with it? The essayist quoted answers this by saying, "The real truth is that we are linked indissolubly together, and neither one could get on without the other." This is a recognized truth as dentistry is organized to-day, but the writer forgets that there was a period within the memory of many now living when a supply house was an unknown quantity, and yet dentistry flourished. The fact is that the supply houses have simply become the assembling houses of dental ideas. It is a fallacy to assume that if all the dental supply houses were to be wiped from the face of the earth that thereby the destruction of dentistry would be assured. The modern dentist doubtless feels that this would be the result, but if he will stop a moment to con-

sider, he will find that the question of demand and supply always regulates itself. In the decades prior to 1830 there were no supply houses, yet instruments were procured, gold was prepared, chairs were made; in fact, all the petty details, now regarded so important, were individually attended to and were satisfactory for the time and conditions.

What the supply houses have done has been to broaden out this individual work, bringing to bear the highest mechanical excellence, specializing so that in assembling the results the highest skill attainable has been reached, thus enabling the practitioner to do better and more effectual work than could possibly have been done under the methods common to the period named.

While this is cordially recognized by the writer, he must constantly bear in mind the fact that the supply houses have been dependent upon dentistry for almost every advance made in this special work. For confirmation of this statement it is only necessary to go back to the origin of these houses. In this country the first efforts were principally confined to the manufacture and sale of porcelain teeth. The dentists of France and the earlier dentists of this country originated and perfected the processes necessary to make an artificial tooth, and to Dr. Wildman of Philadelphia belongs the honor of so perfecting tooth body and tooth gum that no advance has been made since his day. All changes of any value in instruments, from the original forceps to the most valuable operative instruments, have been devised or improved by dentists. While it is true, as our essayist remarks, "The world has never witnessed such a spectacle as the growth of the enormous trade interests that have sprung into existence to satisfy our demands," it is equally true that this growth has been entirely dependent upon the development of the profession of dentistry outside and apart from any supply houses. The demand came from the profession, and it was simply the part of good business to meet it with the best attainable. It is worthy of all commendation that this effort has been remarkably successful, and the dentist of to-day would not willingly return to the original conditions when these supply houses were not.

The distinction has not been properly made between dentistry and its commercial connections. The average dentist is apparently lost in a maze of ethical contradictions whenever this subject is broached. Our essayist seems to have been in a mental confusion

regarding it, and practically came to the conclusion that there was no such thing as a profession, and that we, as dentists, were stultifying ourselves that a difference existed. The true position to assume, as the writer views it, is not one of superiority, but one in which the dividing line is distinctly drawn and cannot be overstepped by either party without injury. The man of trade has his methods, which are not compatible with the work of the profession, and yet, properly conducted, these are strictly worthy of high honor. On the other hand, the methods of the professional man would be destructive to trade interests if adopted by business houses. Both are honest, both are living up to their highest ideals, and both are right within the limits of their environments. It is evident, from what has been said, that the two divisions are dependent upon each other, but neither can absorb the other or directly share in the results.

The illustrations are many of similar conditions in other walks of professional and commercial life. The surgeon is entirely dependent on the instrument-maker for his tools, and were this supply to fail him he would be incapable of continuing his work. The general practitioner of medicine would find it very embarrassing were the pharmaceutical establishment not in existence. To the doctor the druggist is the man of supplies. The ophthalmologist would write in vain his prescriptions were the optical establishment not in existence; and yet the surgical-instrument-maker's announcement would not be accepted by the surgeon as representing his profession. The druggist's circular or periodical would have a value to the man of that profession, but it would in nowise represent the medical practitioner's work; and equally so would be the optical journal in its relation to ophthalmology. The lines are strictly and naturally drawn between all these honorable callings, and it is simply a mental delusion to suppose that things not directly related can be moved out of their natural order.

In view of these facts, it is strange that there should be a constant effort made to enforce upon the dental mind the unsupported theory that there is no difference between commercialism and the profession. This has been carried so far that the large majority of dentists fail to make any distinction between the literature that originates in a supply house and that which comes directly through the medium of professional effort. The stream cannot rise higher than its source, and the journal published by a supply house cannot represent anything but trade. It is an incongruous combination of

words to call such a journal a representative of the dental profession. Dentistry has been misled too long by appearances. The dental journals representing the supply houses have unquestionably held an important place in dental progress. Several of these are ably edited, and are naturally regarded by the majority as the leaders of professional thought in this country. They openly claim to be published in the interest of the dental profession, and are devoted to its interests. This can never be more than a partial truth, and partial truths involve a moral loss not to be compensated for by literary ability or interesting matter.

It is possible the time may come when dentistry will be submerged theoretically into the supply houses and completely so far as its periodical literature is concerned. The outlook for a better state of things is not promising. Money is a recognized force in subverting the ethical sense, and so long as this remains a power the dentistry of the twentieth century will fail to accomplish its highest and most ennobling work.

There is no reason for antagonisms, but, on the contrary, mutual regard and co-operation should be extended; but it should never be forgotten that there is a limit to this, and neither the supply houses nor dentists can afford to overstep the fixed professional boundary line without loss. The actions of individuals and dental societies in thus violating professional ethics has resulted in demoralization in our ranks. It is time for a careful introspection individually and collectively to endeavor, if possible, to discover our true paths of duty to the dental profession, to which we all owe undivided allegiance.

It is very evident that a higher standard of professional life is needed, and if dentistry is ever to reach the true status it will not be through the kindly motives, but mistaken aims, of those who try to harmonize the inharmonious and to bring those together who are separated by a positive and indestructible law.

WHAT DOES IT MEAN?

FROM time to time this journal has been the recipient of various curious documents from "St. Luke's Hospital of Niles, Michigan." They were, as received, regularly consigned to the waste-basket. It seems, however, that one at least does not feel satisfied,—Dr. E. O.

Kinsman, of Cambridge, Mass.,—and he sends the following energetic disclaimer against the unauthorized use of his name as the head of the subjoined circular.

While it has been, doubtless, very annoying to Dr. Kinsman to be placed in this position, those who know him and his long association with the best in New England would never think that knowingly he would consent to have his name connected with any organization forced to resort to such peculiar methods.

This whole business of St. Luke's Hospital seems to require explanation. It is possible some of our correspondents may be able to furnish the necessary information and answer the query, Why a hospital organized for a worthy purpose should find it necessary to resort to such questionable methods?

“NILES, MICH., August 2, 1901.

“DEAR DOCTOR, We enclose you herewith some of our literature for your careful perusal, together with a Dentists' Application blank for you to fill out and return to us, should you wish to join our Dental staff.

“The many advantages, privileges, and financial benefits to be gained by your joining us are briefly and partially told as follows,—viz.:

“1. We issue, in addition to our certificate, a neat lithograph pocket Membership Ticket, which we believe, if displayed judiciously, will pay for your certificate many times over during the course of a year. Should you want only our pocket Membership Ticket alone, it will cost you \$2.00; otherwise, it goes free with the Certificate of Membership.

“2. We have just received a very costly and ornamental Red Cross solid gold button from the wholesale jewellers, lettered in circular form: ‘Staff St. Luke's Hospital,’ which goes free with our new membership; or, if ordered alone, \$2.00.

“3. We will pay you a commission of twenty-five per cent. in cash for all surgical operations, and ten per cent. on all medical cases you may send to our hospital for treatment.

“4. Should you wish to consult us at any time regarding difficult cases, we will freely give you whatever assistance and advice we can, and will make microscopical analysis of specimens sent us free of charge.

“5. We charge nothing for nursing patients day or night, as part of the expense is taken from our Nursing Fund. We do charge, however, for board and rooms ranging from \$1.50 to \$2.00 per day, according to location selected by the patient.

“6. After you have ordered and paid for the certificate of membership, *either in English or Latin*, should you so desire it, and will send us a list of names, not exceeding twelve, including your local newspapers, we will write an individual letter recommending you to each one of them. Of course these letters of endorsement are optional for you to accept or reject, whichever you see fit.

"Now Doctor, after considering all these strong features, we would ask, with all fairness, do you not consider it to your financial interests to have your appointment confirmed? Kindly let us hear from you as soon as possible, and greatly favor,

"Fraternally yours,

"ARTHUR C. PROBERT, M.D., D.D.S.,

"*President.*"

TO THE DENTAL PROFESSION OF THE UNITED STATES:

Be it known that I, Edgar O. Kinsman, D.D.S., of Cambridge, Mass., Secretary of the Massachusetts Dental Society and the Northeastern Dental Association, do hereby declare that the use of my name on the letter-heads of the St. Luke's Hospital of Niles, Michigan, is without my knowledge and consent. I declare it to be an unwarranted use of the same, and make this public declaration to set myself right before the profession and maintain my honor as an officer of the above-named societies.

(Signed)

EDGAR O. KINSMAN, D.D.S.

CAMBRIDGE, MASS., September 21, 1901.

Commonwealth of }
Massachusetts } Suffolk, s.s.

BOSTON, September 24, 1901.

Personally appeared before me the above-named Edgar O. Kinsman, and made oath to the truth of the above statement subscribed to by him.

Before me,

WALDO E. BOARDMAN,

Notary Public.

PROFESSOR W. D. MILLER.

ONE of the interesting incidents connected with Professor Miller's recent visit to this country was a lecture given at the Department of Dentistry, University of Pennsylvania. The return to his Alma Mater was doubtless a pleasant experience to him, but to the large number of dentists and medical men from the city and surrounding country it was a revelation of what can be accomplished by intelligent and persistent labor.

The lecture in the main represented Dr. Miller's work in preparing sections of jaws and teeth, both human and of inferior ani-

mals. Those who have had experience in doing this work could appreciate the labor involved and the excellent results.

The novel feature of the work was not in the cutting, but in the very beautiful effects produced by staining, thus differentiating the various tissues and perfectly and beautifully exhibiting these through the electric lantern. This work is illustrated in the *Dental Cosmos* for October, but, while these illustrations are very beautiful, they do not compare in delicacy of coloring with those of the lantern exhibit.

One of the most interesting portions to the writer consisted of certain specimens that seemed to clear up several controversial points. Dr. Miller, very properly, did not dwell upon these, refraining from expressing any decided opinion. The first series of these specimens consisted of several slides, showing very beautifully the so-called, gelatinous plaques of Williams. The enamel was very perfectly shown covered with bacterial masses and without the slightest break in the tissue, except in one instance, where a previous abrasion had existed.

The question naturally arose in the minds of some of the audience, If gelatinous plaques, with the accompanying bacteria, give an acid reaction, as claimed by Williams and Black, should there not be some slight evidence that the enamel-rods were being gradually affected? So far as it went the exhibit was confirmatory of the opinion held by some that the acid character of the plaques had not been proved.

The second interesting exhibit was a slide remarkable in that it demonstrated the transparent zone of Tomes in two places in direct line with caries on one side of the section, and on another part a transparent zone where caries was absent, but where the tooth showed distinct marks of abrasion from wear in mastication. While this specimen could not settle the controversy maintained upon this subject since Tomes first announced the fact, it was quite confirmatory of the opinion held by Miller and others that the change in the dentine was the result of a slight irritation, in the first place by caries, and in the second by wear,—altogether a vital action in both instances.

It is to be hoped that Professor Miller will give the result of this portion of his work in future articles. It is a gratification to feel that his health is apparently very nearly restored to original conditions.

Bibliography.

IRREGULARITIES OF THE TEETH AND THEIR TREATMENT. By Eugene S. Talbot, M.D., D.D.S., Professor of Dental and Oral Surgery, Northwestern University, Women's Medical School, Honorary President of the Dental Section of the Tenth International Medical Congress, Berlin, 1890, etc., etc. Fourth Edition, with five hundred and eighty Illustrations. F. A. Davis Company, Publishers, Philadelphia, 1901.

This, the fourth, edition of Dr. Talbot's well-known work on Irregularities of the Teeth has been rewritten and rearranged with plenty of new material and new facts," so that it may be regarded practically as a new work.

If we except Dr. Farrar's great work upon the same subject, no author has undertaken to approach this subject from the foundation studies of its etiology, and no one, so far as the reviewer is aware, has attempted to consider this subject from the stand-point of the author. In his preface he writes: "The unwritten law in general medicine, 'that to know the cause is half the treatment,' is also applicable in the treatment of deformed jaws and irregularities of the teeth. . . . Without the knowledge of etiology no one can successfully correct deformities, as is evident in the many failures by men who profess to make this a specialty. . . . He has confined himself entirely to his own appliances and methods of treatment. 'Systems,' in the ordinary Charlatan-like sense, are not accepted as guides. In the author's opinion the practitioner should be familiar with the etiology of the case in hand; his knowledge of principles and mechanics should suggest to him the most suitable appliances for the given case."

This quotation is sufficiently clear that the author has no sympathy with methods which have come into quite general use in the regulation of teeth, and this is made very evident as the reader proceeds in the examination of the various chapters. Whether this opposition to "systems" is based on good grounds, it must be conceded that the author's undisguised opposition to this method is correct if they are made use of without a previous study of the etiology of the subject, but with this intelligence it is difficult to

understand why these cannot be used as effectively as an appliance planned for a given case.

In order that our readers may have some idea of the scope of this volume a portion of the "Contents" is given. Seventeen pages are devoted to History, followed by Heredity, Congenital Factors and Maternal Impressions, Post-Natal Skull and Jaw Development and Periods of Stress, Development of the Cranium and Face, Development of the Jaws, Development of the Alveolar Process, Development of the Vault, Development of the Peridental Membrane, Development of the Teeth, Social Consanguinity, Near-Kin, Early and Late Marriage, etc. The practical subject, which includes appliances, is not reached until the last chapter, under the head of "Surgical Corrections," and this covers forty-four pages. It will thus be seen that the author has not regarded as of much importance the mere description of cases or the preparation of appliances used.

While this may be to some a decided defect in the book, and in the reviewer's opinion it is not satisfactory, it must be remembered that the author's aim is evidently not to write for the mere mechanic, but for the man who is searching for the reason why these irregularities should occur; and if this reason be known, the appliance necessary for its correction is a secondary consideration.

Whether the reader will agree with the author or not in his general argument and his marshalling of facts to support it, it must be acknowledged that he has produced not only an interesting book, but one full of facts that go far to sustain his conclusions.

In the chapter on the "Development of the Jaws, this curious fact is stated presumably on exact measurements. "The lateral diameter of jaws of existent races in Europe is greater than of the same races in America. . . . The jaws in older parts of the United States are smaller than jaws in the newer. The differences between jaws of the residents of Boston and those of Chicago are thus in evidence." Presumably it is to be inferred that the farther west the child is born there will be a proportionate increase in the diameter of the jaw; a discouraging fact, if it be a fact, for those born on the Pacific coast, as they will rapidly develop into the large jaws of the American Indian.

The author discards "dome," "palate," and "arch," in speaking of the roof of the mouth and adopts the word "vault." This includes the hard palate, the soft palate, and the alveolar process.

The author says, "The height of the vault in most cases is far below the average of the present day. In four thousand six hundred and fourteen measurements of normal individuals, made by the author, it was found that the average height of the arch was 0.58 of an inch. The measurement was made from the alveolar border between the second bicuspid and the first permanent molar to the height of the arch. The average of two hundred and fifty-one skulls of ancient and modern Romans, Indians, etc., was 0.56." He further says, "Narrow jaws are rarely observed among pure races. In the examination of the thousands of skulls of early races in the museums of Europe and this country, very few, if any, contracted vaults are found."

Those who have been made familiar with the author's views in his previous work on "Degeneracy: Its Causes, Signs, and Results," will recognize much of that valuable work, in substance at least, in many of the chapters.

Very few, it is surmised, will be prepared to endorse the following relating to consanguineous unions. "The error of the old doctrine upon which was founded the prohibition of consanguineous unions lay, as Strahan remarks, not in asserting that disease and deformity were more often met with in children of these than of other unions, for such is the fact, but in attributing these unhappy results merely to parental blood kindred. Over and above the fact that these consanguineous marriages are almost certain to transmit, in an accentuated form, defect or tendency to disease already present in the family, there is no physiologic reason why such marriages should not take place." This seems to the reviewer to be assuming too much on insufficient data. The fact remains that our asylums are full of the results of such marriages, and the evidence seems to lean strongly in the direction of the truth of the "old doctrine."

These various chapters are all of them intensely interesting to the searcher after the hidden causes of disease, yet there is much in all of these that seems to bear but a remote relation to the etiology of irregularities. Take, for instance, the chapter on "Intellectual and Moral Defects." Taken independently, it is full of valuable material, but it is difficult to see what intimate connection the "moral imbecile" or the paranoiac has with changes leading up to malposition of the teeth, and the pages spent in delineating their peculiarities.

With Chapter XVII., on "Developmental Neuroses of the Face," the author begins the more direct study of matter leading directly up to irregularities, and no criticism can justly be made of the very able marshalling of facts as the reader proceeds. Developmental Neuroses of the Face is followed by The Nose and Interior Facial Bones,—of the eye; bones of the ear; jaws of the seemingly normal; of the maxillary bones; of the vault; of the palate; in teeth position, and this through many pages, covering much of vital importance in the etiology of the subject, but of which space will not permit extended quotations.

"Surgical diagnoses" is the beginning of treatment. It is satisfactory to note, under this heading, that the author has a limit in age in which regulating can be safely performed. There has been a growing tendency to regard it as possible at any age short of senility. The physiological and pathological reasons why this is a mistake is clearly set forth in the following quotation: "The chances for perfectly satisfactory results in regulating decrease yearly after puberty, and after twenty-six are very meagre. At this time the osseous system is fully developed. An unusual amount of force is required to set up inflammation and absorption. It is possible to regulate deformities as late as the thirtieth year. The resulting pain is, however, so severe and the mechanical force necessary to produce absorption of the obstructive portions of the alveoli so great, that the results hardly justify the procedure."

The author's description of the appliances in use in his practice will hardly be regarded as satisfactory. The practical mind will naturally ask, Why confine these to his own experience? His answer is, as given, that they have served his purpose. The reviewer's opinion is that, if much of the matter published in previous works of the author had been eliminated and in its place a more detailed description of appliances and how to make these, the book would have been more valuable to the average dental mind. To one, however, who does not need these practical suggestions the book will be full of matter for thought, and it is for these the author has prepared the volume.

The work of the publisher is deserving of unstinted praise. Everything connected with the book is of a high order of excellence.

Biographical Sketch.

A BIOGRAPHICAL SKETCH OF EDWIN JAMES DUNNING.

BY CHARLES OTIS KIMBALL, M.D.

DR. DUNNING was born in Camillus, N. Y., on July 19, 1821. He was the son of Uriah H. Dunning, a country physician, who also practised dentistry, and Emily James, the sister of Edwin James, physician and botanist, one of the early explorers of the West. He received his early education mostly at Saratoga Springs and Ithaca, where in 1838, at the age of seventeen, with but a few preliminary hints, he began to fill teeth. In the spring of 1839 he entered the office of Dr. Westcott, of Syracuse, studying dentistry with him. In 1844 he came to New York and entered the office of Dr. Eleazer Parmly as an assistant, remaining with him for twelve years. In 1856 he opened an office at 11 Waverly Place, remaining there until he retired from practice in 1874. In 1862 he went to the seat of war as assistant to the Sanitary Commission. During the session of 1867-68 he occupied the chair of operative dentistry in the New York College of Dentistry. In 1872 he went to California, remaining till the spring of 1874, when inflammation in one of his eyes brought on partial blindness and compelled his retirement from practice in May, 1874. He spent the next three years at Lenox, and then went again to California, becoming totally blind that same fall. He remained there till October, 1880. Returning East, he lived at Newton Centre, Elmira, N. Y., and Cambridge, Mass., where he died March 17, 1901, in his eightieth year.

He was married three times,—in 1842 to Lucy Sage, by whom he had six children, the three younger of whom died of diphtheria within two weeks in 1862; in 1869 to Esther Hazard; in 1881 to Christine Boughton. His widow and two sons survive him.

Such is the record of a long life, divided into two periods, which are marked by strong contrast in all outward circumstances. Is there not running through it, now in the sunshine and now in the shadow, a golden thread of purpose which justifies us in

pausing for a moment to consider it? Let us study this life, so deeply furrowed by the divine ploughshare, and note its answer to the question.

A country boy of good ancestry, inheriting a somewhat delicate body, a clear mind, and a resolute will, with tastes and aspirations for art, literature, and music, while being trained at a private school for a liberal education was suddenly stopped and at seventeen years of age forced to work out his own career. He began by filling teeth for his fellow-students, then he taught a district school for a winter, and in the spring entered the office of Dr. Westcott, of Syracuse, to take up the study of what now seemed to him likely to be his life work.

At once "ideals of excellence began to form;" he eagerly "caught every hint in matters of practice;" he "learned from every example of good work and from every dentist with whom he conversed." He "dreamed of excelling and being at some time a practitioner of established position in some city," and, as he simply says, "all I can tell about it is that my dream came to pass."

In 1844, at the age of twenty-three years, he came to this city, entering the office of "that excellent and most courteous gentleman," Dr. Eleazer Parmly, then readily acknowledged as at the head of his profession in this city. Here the country boy, under his preceptor's example and teaching, acting upon a fine and delicate native instinct, quickly won a place in the front rank of the profession, which he held for thirty years. Meanwhile, conscious of his inherited delicacy of constitution, he had systematically striven by various means to develop himself, carrying out the same "ideals of excellence" in his physical life as in his higher life work, till he attained a splendid and lasting bodily strength.

He was a most attractive man, in person tall, strong, and vigorous, with a full, low-pitched, well-modulated voice, with a bright eye and a winning smile, careful and exact in speech, polite and courteous in manner, though he could be upon provocation abrupt to sternness. Thorough, painstaking, and quick in his work, unsparing of himself (and his patients where necessary), but always thoughtful and considerate of others, his constant aim was to excel in work, not for his personal gratification but for the good of others, believing that he was working out his Christian life in his daily work at the chair. As his practice grew and his fees

increased, each increase meant not so much more added to his income as so much more time and care given to each operation.

In the height of his career, at great personal sacrifice, he accepted the chair of Operative Dentistry in the New York College of Dentistry, and the writer, then a young student, well remembers the address delivered by Dr. Dunning when he assumed the chair. Our profession had seemed to him till then a good enough way of earning a living, though rather uninteresting, but Dr. Dunning's intense enthusiasm, his high point of view, and his appeal to the students to take up their work in the spirit of loving service to humanity, as part of the work to which they were divinely called, touched a chord which has never ceased vibrating, and which has contributed not a little to whatever zeal and faithfulness he may possess. Dr. Dunning's methods, however, were too exacting, his views too radical, and his demands upon the students too severe to please the easy-going crowd, and after a year he resigned his chair, being constrained to by lack of support and encouragement. During the thirty years of marked success in life in all its phases the dominant notes were struck by his enthusiasm, his singleness of purpose, the way in which he threw himself unreservedly into all that he did, doing it heartily as unto the Lord. This gave him a great influence over the young men whom he trained, who bear testimony to his ability and faithfulness by careful attention to the details of their work.

Outside of his work all that is best in life appealed to him; he was fond of art; a member of the Academy of Design, associating much with artists; of music, singing himself; of books and literature, conversing well on many topics.

He loved the country, and turned eagerly to it whenever possible. Riding, driving, walking even for great distances, refreshed and strengthened him. His vacations were passed in the Adirondacks, in the celebrated "Stillman Camp," with Emerson, Lowell, Agassiz, etc.; at Lake George with the artist Durand; in Switzerland and Italy, spending much of his time mountain climbing, of which he was passionately fond, or in taking long walks.

To such a man in the fulness of life, only fifty-three years old, with the promise of years of usefulness before him, came the withering touch upon his eyes, and his professional work was forever laid aside, and for one-third of his life he walked in darkness.

There are two touchstones of character, prosperity and adver-

sity, and we cannot feel sure of any man until we note his reaction to each. We have seen Dr. Dunning in prosperity, everything open to his hand, and that in it all a high purpose and resolute self-devotion to his ideals dominated his life. What did adversity reveal? Let me quote the words of an observer: "After a busy and successful professional career he had suddenly been stricken with blindness, but as we walked up and down the beach at Santa Barbara he talked not of the life that was behind him, but of the life that was before him. He was as one that put on the armor, not as one that was putting it off; he was preparing for life; the life of action had passed, the life of meditation had begun; with eager enthusiasm he talked of the great poets who were to be his companions." They had been the amusement and recreation of his hours of rest, now they were to be his friends and teachers. With cheerful courage he turned his face towards the life of the mind, saying, "Now that I can never read Browning's 'Saul' again, I will commit it to memory." Day by day he committed to memory poems of the great English authors, Wordsworth, Tennyson, Browning, Shelley, till he had over sixty poems stored away in his mind ready for a moment's use.

Then he began the study of Shakespeare's sonnets, memorizing them until he had every one of the hundred and fifty-four at his tongue's end, studying also his other poems, memorizing some, reading and re-reading each play from one to six times, and then meditating upon them "during his waking hours by night and by day through many years," until their meaning came clearly to him as a revelation of the great poet's deepest inner experiences in his poetic life, and he thought with such a spiritual exaltation that his own blindness seemed almost a providential boon. Thus "for more than twenty years Dr. Dunning exhibited to all who knew him the power of the spirit to triumph over bodily infirmities; his years of blindness were years of intellectual growth."

The results of this profound study, this daily living with the poet, were published in 1897, when he was seventy-six years old, under the title "*The Genesis of Shakespeare's Art.*"

These years of darkness were not years of gloom; they were years, as we have seen, of a growing intellectual life. They were filled with intense interest in the life of the world, with prevailing cheerfulness and a serene Christian faith that made them, as he often said, his best years.

And the golden thread running through all, through the shadow and the sunshine, the bright days and the dark weaving both into a beautiful life, making its study worth our while, was the steadfast purpose to regard every power and ability as a divine trust to be used to the full in the service of man.

“Then soul, live thou upon thy servant’s loss,
 And let that pine to aggravate thy store;
 Buy terms divine in selling hours of dross,
 Within be fed, without be rich no more.
 So shalt thou feed on Death; that feeds on men;
 And Death once dead, there’s no more dying then.”

Miscellany.

LOCAL ANÆSTHESIA WITHOUT RISK OF DANGER.—Rasely (*International Journal of Surgery*, April, 1901) has found chloretone equally as good as cocaine in operative cases, including the incision of abscesses, amputation of fingers, and even in the extraction of teeth, without the least evidence of a depressing effect.

He has operated on a case of complete fistula in a man seventy-four years of age, with fatty degeneration of the heart, using chloretone as the anæsthetic for several reasons. No pain was felt, and there was not the slightest manifestation of depression or exhilaration, although syringe-ful after syringe-ful of the saturated aqueous solution was used in the line of the proposed incision.

Rasely thinks chloretone an ideal local anæsthetic, and he believes it to be sure in effect and safe in result. He thinks it is well adapted to take the place of cocaine in subarachnoid anæsthesia.—*Therapeutic Gazette*.

CURING A BOIL.—A writer in the *Peoria Medical Journal* describes his method of treating boils as follows: “To render the process painless, a few drops of cocaine are introduced into the tissues and cavity of the boil, using a very fine needle, which is at first allowed to rest with its point upon the inflamed surface with merely the weight of the syringe to gradually force it beneath the

skin. If there is a drop of cocaine upon the point of the needle, it will soon prepare the way for the further and more forcible introduction without pain, and then the cavity is made to receive enough to completely anæsthetize its surrounding tissue. When that is accomplished, a little larger needle is readily introduced and several drops of ninety-five per cent. carbolic acid are pressed tightly into the cavity. Absolute sterilization is invariably secured, and with absolutely no suffering to the patient whatever. A felon may be treated in the same way.”—*Southern Medical Journal*.

TO WAX TOGETHER A BROKEN VULCANITE PLATE.—A dentist often needs three hands; for instance, when he essays to wax together the separate parts of a broken vulcanite plate. Two hands are necessary to properly hold the denture. My third hand, or assistant, is in the form of a device which holds the wax over the denture until it melts, and then lets it drop.

Take a bar of metal about one-twelfth of an inch thick, and solder to one end a small spoon-shaped piece large enough to hold as much wax as is ordinarily employed in waxing together the broken parts of the plate. While the other end of the bar is stuck into a hole in the table, or is held by a vice, let this spoon-shaped end be arched forward so as to rest about three inches above the table. Make a whole in the bottom of the spoon about one-twelfth of an inch in diameter. Into this little spoon place the wax. Then set an alcohol flame under the bar at an inch or two from the wax, so that the heat will creep down the bar to the wax. Soon it will melt and drop. The broken plate can thus be held steadily by two hands resting on the table.—STEWART J. SPENCE, *Dental Brief*.

A METHOD OF SECURING DAM CLAMPS ON CONICALLY SHAPED TEETH.—The adjusting of the rubber dam on some teeth, especially on some molars, is a vexatious undertaking. A method found to work nicely in the class called “conical” is as follows:

In order to overcome the difficulty and still use an ordinary clamp, have a varnish of shellac and alcohol. Place either a napkin or some of the absorbent materials in the mouth and around the tooth, and dry it as thoroughly as possible. Then apply some of the shellac varnish to both the buccal and lingual surfaces of the tooth,

and allow it to dry. Saturate two pieces of spunk about twice the size of a pin-head in some chloropercha. Place one of these on the buccal and the other on the lingual surface of the tooth in a position to hold the clamp. In a few minutes the chloroform will evaporate and cause the spunk to adhere. Then the clamp and dam can be passed over the tooth and the two little spuds of spunk to position without the operator's being annoyed by the clamp working off the tooth. This is a simple but a very effectual remedy.—C. E. BELLCHAMBER, D.M.D., *Dental Brief*.

[I have often in these cases employed sandarac varnish on the tooth for the purpose of securing a surface over which the clamp will not slip, to my great satisfaction.—McCLAIN.]

Current News.

INSTITUTE OF DENTAL PEDAGOGICS.

THE ninth annual meeting of the Institute of Dental Pedagogics will convene on Tuesday December 31, 1901, and continue for three days, at the Hotel, Seventh Avenue, Pittsburg, Pa. The usual New-Year's-Day rates can generally be obtained.

This is the only normal school existing in the dental profession. *Come everybody and see it perform.* A partial programme is submitted:

President's Address. By G. E. Hunt, Indianapolis.

Conduct of the Operatory Clinic (a method of keeping records, grades, etc.). By G. V. Black, Chicago.

Executive Work of the Faculty (a symposium). By Drs. Kirk, Patterson, Stubblefield, and Hart.

Metallurgy: How to teach. By Dr. Hodgen, San Francisco.

Class-Room Methods of Teaching (symposium). By Drs. Hoff, Nones, Tenney, and Foster.

Teaching Prosthetic Dentistry. By G. H. Wilson, Cleveland.

Bacteriology: How to teach. By W. R. Blue, Louisville.

Report of Committee on Operative and Prosthetic Technics. By Drs. Week and Hoff.

D. M. CATTELL,
Chairman Executive Board.

COLORADO STATE BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of the State of Colorado will meet in Denver, Tuesday, December 3, 1901, at nine A.M., for examination of applicants for license to practise dentistry in Colorado.

In addition to written and oral examination, applicants must supply their own patients, instruments, and materials, and come prepared to do practical work under the supervision of the Board, which will pass upon suitable selection of cavities.

All applications must be completed prior to December 3.

For application blanks and information, address

H. F. HOFFMAN, *Secretary*,
611 California Building, Denver, Col.

BOARD OF DENTAL EXAMINERS OF PENNSYLVANIA.

THE Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg, December 16 to 19, 1901. Apply to the Hon. James W. Latta, Secretary Dental Council, Harrisburg, Pa., for papers and information.

G. W. KLUMP,
Secretary.

PENNSYLVANIA STATE DENTAL SOCIETY.

At the annual meeting of the Pennsylvania Dental Society, held at Ligonier, July 10 to 12, 1901, the following officers were elected:

President, M. H. Cryer; First Vice-President, R. H. Nones; Second Vice-President, J. A. Libbey; Recording Secretary, C. V. Kratzer; Corresponding Secretary, V. S. Jones; Treasurer, R. H. D. Swing.

Executive Committee.—R. H. Nones, Grant Mitchel, H. M. Beck.

V. S. JONES,
Corresponding Secretary.

BETHLEHEM, PA.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

THE twenty-seventh annual meeting of the Mississippi Valley Medical Association adjourned at Put-in-Bay, after a most successful session, on the morning of the 14th, out of respect to our martyred President. The following officers were elected for the ensuing year:

President, S. P. Collings, M.D., Hot Springs, Ark.; First Vice-President, J. C. Culbertson, M.D., Cincinnati, Ohio; Second Vice-President, Paul Paquin, M.D., Asheville, N. C.; Secretary, Henry Enos Tuley, M.D., Louisville, Ky.; Treasurer, Thos. Hunt Stucky, M.D., Louisville, Ky.; Chairman Committee of Arrangements, A. H. Cordier, M.D., Kansas City, Mo.

The twenty-eighth annual meeting will be held at Kansas City, Mo., October, 1902.

HENRY ENOS TULEY,
Secretary.

COLORADO STATE DENTAL ASSOCIATION.

AT the annual meeting of the Colorado State Dental Association, held in the Brown Palace Hotel, Denver, July 9, 10, and 11, the following Officers were elected for the ensuing year:

President, J. Stewart Jackson, Denver; Vice-President, Theodore Ashley, Canon City; Secretary, W. A. Brierley, Denver; Treasurer, Wm. Smedly, Denver.

The next annual meeting will be held in Colorado Springs during June, 1902.

W. A. BRIERLEY,
Secretary.

70 BARTH BLOCK, DENVER, COL.

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Original Communications.¹

ORAL PROPHYLAXIS.²

BY D. D. SMITH, D.D.S., M.D., PHILADELPHIA.

IN the summer of 1882 the Pennsylvania State Dental Society came over into this great Empire State of New York and held its annual meeting in Chautauqua. I never understood the true reason of this unusual procedure, the convening of a State society outside the boundaries of its own State, but I remember the proceedings as well as the discussions at those meetings, and plainly recall some of the participants.

It was my part and privilege to advocate for the first time the practice of utilizing roots and sound teeth, even to the destruction and extirpation of normal pulps, where necessary to make them available as supports for sustaining artificial teeth or bridge-work.

I had at the time little comprehension of crown- and bridge-work as exhibited at its best to-day, but I felt and knew that the destruction of the pulp did not mean the destruction of the *tooth*, and whilst the practice was without the test of great experience at that time, it yet had the underlying support of reason as well as

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the New York Institute of Stomatology, June 4, 1901.

physiological principles. I shall probably never forget the discredited, crestfallen state in which I emerged from these discussions for my somewhat timid advocacy of what was then a most unpopular and heterodox practice. Nineteen years have rolled around, and what a change in sentiment! The Central Dental Association of New Jersey, at its meeting in January, 1901, awakened to a kind of symposium discussion of practically the same subject: "Is the dental pulp necessary in the tooth of the adult?"

The consensus of opinion, as I read the articles in the March number of *Items of Interest*, leans decidedly in favor of the theories and methods which were so severely denounced by men of prominence at the meeting of the Pennsylvania State Dental Society in 1882.

This first attempt at a comprehensive discussion of the value of the pulp in adult life, as given in the articles alluded to, fails in each individual instance to grasp the vital issue. The point of real vital importance is not touched, and as a consequence this discussion fails in the unification of any fixed or definite conclusions or teachings.

To arrive at any adequate conception of the value of the pulp in adult life, there must first be a better and clearer understanding of what constitutes *tooth-life*. And in order to do this, the ordinary complex division of the tooth should be abandoned, and the tooth resolved into its natural and distinct parts, crown and root, with full recognition of its two separate and distinct sources of life and nutrition. There must also be recognition of the fact that the *root* of the tooth, and not its crown, is the real, vital, living anatomy. A genuine living, functional tooth can be maintained without any portion of its natural crown; but a crown, no matter how perfect it may be, is entirely valueless unless supported on a living root. It must be recognized that the pulp-life which goes alone to the crown in its entirety—to its dentine and enamel and to the dentine of the root—is entirely separate and distinct from the life of the cemental tissue of the root; and that this cemental life is supplied wholly by the pericementum and its adjuvants. The crowns of teeth may be slightly affected or largely destroyed by decay, or even entirely obliterated, without appreciable interference with the integrity, utility, or even the æsthetics of the real tooth.

The fact that a tooth with a living pulp and an unimpeachable crown may, and often does, become entirely valueless through dis-

ease in cemental and pericemental tissue, fails of recognition even in the discussions of this New Jersey Society.

What shall become of a pulp, either through disease or interference, is a matter of trifling import so long as the cemental and pericemental life remains intact. *But destroy the pericemental life, and you destroy the tooth.*

Again, to form a just estimate of the value of the pulp in adult life, there must be an appreciation of the influence of misdirected pulp-activity in converting the cementum of the root into denser structure, as frequently results in adult life. Cementum, that all-important tissue of the root, is thickest and most abundant and most vascular in young life; and because of this the integrity of the tooth is best maintained at that period. Teeth with *dense* cemental tissue, sparsely distributed over the roots, are found in adult life only; and this denser cemental tissue is always, we believe, on teeth with living pulps; whilst abundant and properly distributed cemental tissue, so necessary to the conservation of the tooth, is found on young teeth generally, and on teeth and roots with devitalized pulps.

I have before made the assertion, and it stands without contradiction, that pyorrhœa rarely or never begins in *young* adults; neither is it found in connection with devitalized teeth where the devitalization occurred in young life. These conditions existing, it necessarily follows that whilst through destruction of the pulp there may be inconsequent injury or damage to the crown, there is yet no interference with cemental and pericemental life and consequently no injury to the real, living, and most important part of the tooth. These phenomena and deductions, as addenda to the discussions on "the value of the pulp in adult life," are not speculative merely, but they bear important relations to one phase in particular of oral prophylaxis.

For years it has been, and still is, a settled conviction with me that dentistry, with all its conceded progress and improvements, has yet neither done its most important work nor met the reasonable demand of suffering humanity. It has occupied itself in mechanics and mechanism; in the change and improvement in instruments and appliances; in the presentation of materials and methods, and has left the more important matters of cause and prevention almost wholly without investigation.

Time and again we have changed our advocacy of this method

and that material; running this procedure through the whole gamut of amalgams and cements; of gold, crystal, soft and cohesive; using it in mats, rolls, and sheets. We have filled with mallets innumerable, contouring without matrix and with. We have followed professional instruction, and made "cavity preparation" the most important part of our operations. We have compounded fillings and protected cervical margins with amalgams, tin- and soft foil, and yet, as if in very mockery of our mechanical efforts, decay and redecay have marched steadily forward; and to-day the most popular theme for dental discussion is not prevention by removal of cause, but "prevention by extension." In an article of over thirteen pages in *Items of Interest* for May, 1901, E. K. Wedelstaedt, D.D.S., gives to the profession and to the world the methods which, he says, "I teach and follow, and which I feel should be followed by all who have the welfare of those whom we serve at heart." Surely we may pause before this dental professional pen and weigh its teachings, although "the waiter begs to offer an apology for this disconnected answer, for it could only be hastily dictated at different times when he had a little leisure." This "disconnected answer," as I read it, seems to be largely a eulogium of what is styled in the paper the "Black methods" of filling teeth, and a medium for bringing prominently into view an extensive private practice, eighty per cent. of which consists of the removal of old fillings (how old these fillings are is not stated), but some of them are acknowledged to be "very beautiful," but still "requiring to be replaced by fillings of a somewhat different character." Dr. Wedelstaedt says, "Since the arrival of the essayist's paper" (probably not over a month) "I have seen no less than a hundred patients for whom it will be necessary to replace a large number of fillings that have cavities of decay around them which were placed in the proximal surfaces of their teeth, and all these cavities of decay have been caused by opportunities which were left by the previous operator. In not one case was there a practical application of the extension for prevention theory."

Let us call to mind what it may mean when one man in ordinary practice, in the space of possibly four weeks, sees one hundred new patients,—an average of four to six per day,—"with extensive decay around the fillings of other operators."

Eighty per cent. of the efforts of dentistry, if we accept the statements of Dr. Wedelstaedt, are failures. I quote his words:

"Full eighty per cent. of the work I make is the removal of and the replacing of poorly made fillings which have failed on account of non-extension for prevention."

Hence eighty per cent. of the time given to dentistry is worse than wasted; and it thus becomes a cruel, unavailing infliction of suffering, a waste of time and means, and a useless exhaustion of nerve energy and of physical strength. In the face of all this claimed weakness of dentistry, our author and teacher is clamoring for another change in *mechanical methods* with which to cure defects having bacteriological and chemical causes. Unqualified condemnation is heaped upon what he calls "the methods of 1875;" and yet what those methods are, in view of the varied and independent styles of operating, it would probably be difficult for any one to explain. No distinction is drawn between the tooth-saving operations of such men as the late Marshal H. Webb, William H. Atkinson, McKellops, of St. Louis, Frank Abbott, of New York, and of many still in service, as Darby, Jack, Allen, Daboll, and many others, and the merest tyro.

And this quite prepares us for the climax,—the unique classification of dentists by our author. He says, "The members of the dental profession at the present time are divided into two classes: first, those who individualize their *work*, *build* [!] their cavities after some definite plan, systematize their *work* [!], and have *some idea regarding what they do*; and second, those who fill holes."

"It is a simple question, and let each answer for himself: To which class do *you* belong? I ask that you consider this question and also these two closing paragraphs."

We are more or less familiar with the "building" of the complicated towering structures of the present; with the "building" of locomotives, bridges, and other great works, but it seems new to think that any of the dental profession are engaged in "building cavities" or even "filling holes." That a dentist should "systematize his work and have some idea regarding what he does" does not seem a high standard of culture or one indicative of specially exalted attainments for men practising a profession; but this is the professional standard to which, according to this teacher, we are to attain.

The "closing paragraphs" are as follows: "It is now well understood that filling-material without cavity preparation is not a potent factor in saving teeth, but *filling-material in connection*

with cavity preparation is the most potent and only one for intelligent men to take into consideration in discussing any theory relating to the *care* and *salvation* of the human teeth. Scientific men recognize this as one of the fundamental principles and the advance and progress of dentistry depend wholly upon the practical application of this theory." I have put some of the matter quoted in italics the better to contrast its force and meaning.

According to our author we must desist from "discussing any theory relating to the care and salvation of the human teeth," which does not make "filling-material, in connection with cavity preparation, the most potent factor and the only one for *intelligent* men to consider."

Must the dental profession accept the dictum of such teaching or risk the ostracism of "scientific" or even "intelligent" men? In view of the limited horizon of such professional vision and the slavish subjection of dentistry to its teachings, is it any wonder that we are regaled with such editorials as that of Dr. Truman, which appeared in the INTERNATIONAL DENTAL JOURNAL for June, 1901? He says, "We are floating in shallow waters. . . . It would seem that we have not been doing all that is possible to meet changing conditions. . . . It is quite evident that all this means for dental colleges a more stringent method, if not a new standard of training."

It may be well here to recall the fact that Dr. H. C. Wood, a professor in the same University with Dr. Truman, has declared the D.D.S. to be "a badge of partial culture."

At the risk of being considered "unscientific" or "non-intelligent," I propose this evening to direct your attention to a subject which I consider of far greater importance to the profession and to our patients than the matter of "extension for prevention."

It may seem presumptuous to intimate that in this subject of Oral Prophylaxis, when fully comprehended, are matters of a magnitude to radically modify the present thought and conception of dentistry, and to greatly change the present methods of practice. To advance a step farther and suggest that there is hidden away under the *débris* of the oral cavity secrets of greater importance to the comfort and welfare of civilization than the great discovery of vaccination by Jenner in 1796 will doubtless seem as a magnification verging on absurdity. And yet we venture to predict that the future of dentistry will disclose this as a truism.

In the discussions of your society following the paper of Dr. F. L. Bogue one gentleman is reported as follows: "But to view this subject simply from the acid stand-point, and to say that environment only is to be considered, is not a fair statement of the question. The physical and chemical make-up of the tooth must in the nature of things equally influence the action that takes place, and as these vary in relative value in different cases, they are not constant factors;" and after further discussion involving several paragraphs the summing up is as follows: "And so this paper of Dr. Bogue goes a great way, I think, to support the views of so many of us, that there is something else besides environment to be considered in seeking a full solution of the philosophy of the decay of teeth." If "something else besides environment" is "to be considered in seeking a full solution of the philosophy of tooth-decay," surely nothing else is needed in seeking the philosophy of *prevention* of tooth-decay. It is change of environment. The summing up of the remarks of another is reported as follows: "When we arrive at conclusions based upon all the facts we are able to obtain, we will probably begin to consider these conditions from the view-point of specialists in medicine, and look for remedies which will influence oral fluids." This reminds me of a discussion along these lines at the Tri-Union Meeting in Richmond, Va., in May, 1900, at which one gentleman strenuously maintained that the proper thing for dentistry is to teach physicians; for they, "having charge of the little stomachs of the children, could so prescribe for them as to make good teeth."

Dentists teach physicians to prescribe for the making of good teeth! With oral fluids changing every hour of the day in health and disease in each individual; with mucus, acid, and saliva from three sets of glands, varying in character, now neutral, now alkaline, and now acid! Remedies to influence these conditions for the benefit of the teeth! What are the remedies? When administered? Under what circumstances? and How? Is this a proposition designed to be seriously considered as within the bounds of probabilities? Or is it some gossameric web of the imagination, floating far above earthly possibilities in an attenuated ether of a vague, dreamy nothingness?

There are three specially important subjects involved in the discussion of oral prophylaxis,—viz., Dental Caries, Alveolar Development, and Pyorrhœa Alveolaris,—all of which I shall be glad

to consider with you if time and your patience permit. First, as to the discoveries and bearings of treatment in their relations to dental caries.

We all know what a perplexing theme the cause of tooth-decay has been in the profession in the past; how many theories have arisen and, shining for a time, have vanished "as a dream when one awaketh." There is the old chemico-vital theory, the electro-chemical theory of Dr. Palmer, in which there is a modicum of scientific truth, and the more advanced theory of Dr. Miller, to whom for its elucidation the profession is greatly indebted. The theory of Dr. Miller may be classed as chemico-bacteriological; decay being ascribed to the presence of bacteria and the chemical action of their products.

It is not my purpose to attempt to answer the question, What is tooth-decay? but we may properly consider one near of kin, but more practical, more closely identified with our interests, and altogether more important,—viz., How do teeth decay?

In previous writings, notably a paper read in 1898, the author has persistently maintained that tooth-decay always has its origin from the external surface of the tooth; if in the crown of the tooth, it begins in the enamel; if the parts are devoid of enamel, it begins at the surface of the dentine. Re-solving the enamel until contact with dentine is gained, it expands and proceeds along the lines of the tubules in the direction of the pulp. The progress of this process of chemical tooth-solution, which we call decay, is hindered and opposed by two conditions only,—namely, the constituency and consolidation of the dentine and the vital energy, a force often scarcely appreciable, interposed through the existence of the living pulp. It would seem that if any feature of tooth-decay is reasonably well defined, *this* is that feature; and yet I notice that this society has recently discussed this very proposition; and that not seemingly with any hesitancy or doubt, but with the full assurance of a settled finality.

To give emphasis to what is to be said on this subject, I will quote a paragraph from the discussions on the paper of Dr. Bogue, *INTERNATIONAL DENTAL JOURNAL*, May, 1901, page 335: "There is one remark in the discussion of the subject by Dr. Bogue to which I would like to take a slight exception,—namely, that teeth which are thoroughly clean will not decay. Clinically, I know of apparently clean teeth that have decayed, teeth which have been kept so

absolutely clean that it could not be said that they were not so. I have attributed these cases to the fact that there is something in the enamel that invites decay that is not apparent on the surface. I only state it as an exception to the rule. I believe in general that clean teeth do not decay; in fact, I have very radical opinions on the subject." When a gentleman of the standing and attainments of Dr. Allen can talk of "apparently clean teeth that have decayed, because of something *in the enamel* that invites decay," we are forced to the conclusion that there is something radically wrong, *not* in tooth-enamel, but in the present thought and methods of dentistry.

Were we required to enunciate the fundamental principle governing treatment in a case of surgery, we would unhesitatingly say, first look for the cause, then endeavor for its elimination. This principle is as good and as applicable in dentistry as in surgery.

And in reviewing this matter we assume with confidence that the *beginnings* of decay are at the surface of the tooth, and that the agent or cause of it, whatever we may decide it to be, must reside in the menstruum in which the tooth is perpetually enveloped.

How, then, shall we interpose a sure, safe, and effectual preventive?

Prior to the publication of the paper, "Prophylaxis in Dentistry," in 1898, there were a few feeble, sporadic suggestions wholly in the direction of germicidal washes, but practical, beneficial results were entirely wanting. How could there be beneficial results from the occasional use of a doubtful germicide when the one and only remedy is the entire, positive, and frequent removal from tooth-surface of all matter inimical to tooth-life as well as to its composition?

Is not this in accord with reason and careful observation? And if so conceded, shall it be cast aside and rejected, as has been the teaching in some quarters, because it has not been ground in the mortar of a chemical laboratory or scrutinized under a high-power microscope?

Let us make a simple indisputable test. A devitalized tooth, sometimes, but improperly, called a "dead tooth," is generally conceded to be subject to more rapid decay in the mouth than a similar tooth with a living pulp. Let a pulpless, decayed tooth be removed from a mouth where the environments are such that re-solution is

rapidly taking place, and let it be placed in water, alcohol, or glycerin, or simply exposed in the air, and we know that decay is immediately arrested and that further disintegration results only with the lapse of years.

It is wholly unnecessary to institute a process of artificial decay to prove the fact that when a tooth, bad or good, hard or soft, is removed from its environments,—from the menstruum of the mouth,—decay is at once arrested. The discovery and enunciation of the important fact that enforced and systematic change in the environment of the teeth in the mouth will prevent decay and carry with it many other beneficial results is new,—new in essence, new in conception, and new in its elaboration,—and results wholly from clinical investigation and experimentation.

It would probably be of interest to speak of the conditions and necessities which led up to these discoveries, but we may more profitably spend time in the study of what constitutes change of environment for the teeth, and what the process, as herein outlined, really does for them and for contiguous structures; the manner in which it is accomplished, and how it is maintained.

Treatment of the teeth for complete change of environment, briefly stated, consists in thorough removal, at frequent and regular intervals,—once a month has thus far proved most satisfactory,—of all accumulations, whether solids, inspissated excretions, semi-solids, or bacterial formations, from all the exposed surfaces of the teeth, leaving the enamel, or whatever of the tooth may be exposed, thoroughly polished and thus in the best condition to void hurtful deposits and equally to favor all efforts of the patient in the direction of cleanliness.

It is readily demonstrable that to secure and maintain true cleanliness in the mouth, even on the part of the most painstaking, is impracticable if not impossible, without the direction and assistance of an expert and intelligent operator.

There are calcific deposits constantly increasing; the more immediately hurtful acidulated bacterial accumulations; inspissated mucus retaining decomposing particles of food and furnishing most favorable conditions for bacterial culture and the retention of excretions, not alone from the gum margin, but from the whole gum surface. Besides these, there are irregularities; formations and positions inaccessible to all ordinary methods of cleansing which implies the perpetual retention of matter inimical to the

teeth and gums. These injurious accumulations with their equally injurious emanations, hitherto overlooked and disregarded by physician or dentist, are not only causes of decay, but are equally causes of absorption of alveolar structure and recession of gums. These latter conditions are far more to be dreaded than simple decay.

Recognition will yet be made of the important fact that to the presence of foreign matter on and about the teeth, rather than to the quantity of it, the beginnings of decay and pyorrhœa are wholly attributable; and the deleterious influence of a breath perpetually loaded with offensive emanations from this source, especially during seasons of salivary inactivity, as in sleep, will, we believe, ere long be disclosed as an important factor in many pulmonary and digestive disorders, and will be taken account of in medical diagnosis and treatment.

An interesting series of experiments to determine the precise conditions under which disease germs are carried by droplets of saliva when a person speaks or coughs or sneezes is described by Hermann Königer in the *Zeitschrift für Hygiene und Infektionskrankheiten*. The main results are given in an abstract in the *Revue Scientifique*, Paris, August 14, 1900:

“The author has been able to assure himself that in an apartment where there was no appreciable current of air, a person speaking, coughing, or sneezing could scatter germs to a distance of more than seven metres (twenty-two feet). The dissemination in speaking is different in different individuals, and the germs scattered abroad through the air by means of these droplets remain in suspension for only a short period. These droplets are really microscopic balloons having in the centre a bubble of air. The dissemination of these droplets, with germ-originating capabilities and tendencies, is most marked during coughing and sneezing. The dissemination by means of droplets is especially to be feared in case of small micro-organisms, such as the germ of influenza, of plague, and of pneumonia. The *bacillus prodigiosus* and the *bacillus mycoides* is not carried as far, and the danger of infection is consequently lessened.

“The more pathogenic microbes the mouth contains the greater the danger. Washing the mouth has the effect of decreasing the number of diphtheritic bacilli susceptible of being detached. Placing the hand or a handkerchief before the mouth prevents the emission of droplets charged with tubercle bacilli. In cases of

pneumonia it would be necessary to wear a mask in front of the mouth. During a surgical operation no one present should speak. Measures might, of course, be multiplied indefinitely as suggested by this important idea of the scattering of microbes by droplets of saliva."

In view of the fact, as herein set forth, of the imminent and ever-present danger of infection from the inhalation of bacilli-producing droplets of saliva from mouths almost universally infected, is it not time for dentists and medical men to awake to the importance of enforced and positive cleanliness for mouth and teeth? The prophylactic treatment advocated in this paper contemplates the absolute and positive removal of the unseen, but real, bacterial plaque present in some situations on every untreated set of teeth, as well as the removal at frequent intervals of gum exudation, heretofore unsuspected and untouched, and the frequent and perfect polishing, by hand methods, of all exposed tooth-surfaces.

The establishment and maintenance of these conditions in the mouth has been found not only possible, but the feasibility of it has been fully demonstrated.

The process has been more commonly alluded to as cleaning teeth, but there is a wide distinction between the ordinary methods of "cleaning the teeth" and this system of prophylactic *treatment*. The difference is, first, in appliances and methods; second, in extent and thoroughness of the operation; third, in the persistence and frequency of the treatment; fourth, in the object sought and the results attained,—the prevention both of decay and pyorrhœa.

When necessary, scalers should be used for the removal of solid deposits and such mucous concretions as may have been the means of softening or causing a partial decalcification of cervical enamel; and this should be perfectly attained. Following this, the teeth should be *thoroughly polished on all exposed surfaces*,—the labial, buccal, palatal, lingual, mesial, distal, and, in cases of developing teeth, the occlusal as well. The hand-polishing with stick and pumice should reach to every exposed portion of the tooth, and be continued until the touch, which can be educated in this matter to distinguish better than the eye, gives evidence of thorough cleansing and polishing. The operation is best done with properly shaped orange-wood sticks charged with powdered pumice-stone. The prepared orange-wood is most conveniently handled and carried

to positions desired by an efficient and properly shaped porte-polisher.

We believe there is no such thing as "a positively clean tooth," unless it has been made so by some special artificial process of cleansing.

The grit of not too finely powdered pumice-stone has been found best adapted for removing viscid mucoid accumulations and for polishing enamel surfaces; and what is even more important,—and now notice,—the friction of the stick and pumice as applied by hand—*for power-polishers should never be used*—seems to excite or stimulate the vital forces of the tooth to increased activity in the removal of waste and the deposit of new and better material. The effect has been likened to massage treatment for muscular tissue.

The benefits resulting from this treatment are most marked, and extend to all parts of the tooth.

Whilst the deciduous and young permanent teeth are most responsive, all classes of teeth, and teeth of all ages, are peculiarly and positively benefited, as is plainly shown in them after a few months of regular and careful treatment.

The benefits are not to the enamel or treated surfaces alone, but results are equally pronounced in pericementum, gums, the alveolar structure, and apparently in the dentine and cementum. There are striking exhibitions of change and improvement of color in the enamel, while it is apparently taking on from month to month a firmer texture and a more compact resisting structure. The change in color is from an opaque, old-ivory appearance to that of clear, translucent, polished enamel, the whole giving the appearance of increased density and general improvement, denoting decay-resisting structure; the apparent stimulation from the treatment rapidly changing the color of the tooth, diminishing its sensitiveness, both externally and internally, and greatly improving its quality; changes which have impressed and astonished the author as perhaps no other results from operations on the teeth or in the mouth have ever done.

But let it be clearly noted that our claim is that, whilst in this endeavor after change of environment the teeth are rendered immune, this result is by no means the only benefit, if, indeed, it is the most important.

Unlooked-for outgrowths from this treatment in other directions

have been both surprising and satisfactory; developments have been so rapid as to make it difficult to keep pace with them. Again and again I have been compelled to advance what I had considered to be the extreme boundary lines into new territory.

Starting with the discovery of the true method for the prevention of tooth-decay, it quickly extended into the domain of tooth-betterment. There is an evident stimulation of the life forces of the tooth in this treatment, both through the pulp and through the pericementum and its adjuvants. The pulp is stimulated to the work of taking up the old stagnant, color-giving matter, and to the laying down into a more perfect organization of new, health-giving elements. The unsightly yellow in the crown and the dark brown so frequently found in the cervical dentine of exposed roots are replaced by the clear, translucent matter, best comprehended under the term tooth-color. I have seen in several instances, as a result of this treatment, the irregular unsightly white spots on labial faces of front teeth, a condition indicative of interrupted nutrition between dentine and enamel, resume a normal life-like appearance; and in a greater number of cases the dark brown, in root-exposed cervical dentine, replaced by matter of normal color.

INFLUENCE ON GUM TISSUE.

A constant and by no means inconsequent result of the treatment is a decided change of condition in appearance and in fact, of the whole gum tissue. This change is more quickly noticeable than that in the teeth themselves. Relieved of the irritation due to the presence of the toxic matter at the cervix, the gums begin at once to lose the abnormal sensitiveness which often attaches to them, as well as the dark, congested appearance, indicative of the presence of an irritant, and to take on, especially over the alveolar process, a beautiful and permanent *striation*. Improvement in the festoons is equally noticeable, they assuming a more regular and pleasing appearance; there is change for the better in the whole aspect of the mouth.

BENEFITS TO ALVEOLAR STRUCTURE.

Of the better, more regular and harmonious alveolar development resulting from this treatment I do not care now to speak with great emphasis, and only from the clinical stand-point. As the larger percentage of my patients who are under this treatment are in the period where the alveolar structure is endeavoring to make

room for developing teeth (ranging from four to twenty years of age), the opportunity for observation on this point has been of a fairly satisfactory nature.

In every case where the eruptive process has been specially noted, from the sixth-year molar to the wisdom-tooth, there has been apparently an easier and a more natural eruption of the tooth, accompanied with less irritation to the surrounding parts; the expansion of the alveolar structure has been natural and proportionate to the room required for the erupting teeth.

In several instances where, from the crowded condition of the jaw, development, especially of the cuspid teeth, seemed to have been arrested, the relief afforded by this treatment—the frequent removal of obstructive matter on the teeth and from about the gums of the necks of the teeth by hand-polishing—has induced a resumption of the retarded eruptive process, and the teeth are now steadily and satisfactorily pressing their way into normal position.

I am more and more convinced that the practice of early interference with protruding cuspids, through other means than endeavors to induce alveolar expansion, is radically wrong and to be discouraged.

This treatment is greatly beneficial to the general health, removing as it does at regular intervals the excretions of gum and alveolar tissue, as well as the viscid mucoid accumulations gathered especially through the mischievous working of nocturnal mucus. It prevents the introduction of much solid toxic matter into the stomach and lungs; it greatly relieves the breath of offensive odors and of disease-giving bacterial culture, and maintains a condition of cleanliness for the mouth unattainable by other means.

To the undisturbed presence of toxic matter on and about the teeth we unhesitatingly charge the beginnings of all gingivitis and all pyorrhœa; hence it should be the true preventive, as it is when properly directed, the one remedy for this dread disorder.

THE TONGUE AS A BREEDING-PLACE FOR BACTERIA.¹

BY M. H. FLETCHER, D.D.S., M.D., M.S., CINCINNATI, OHIO.

It is evident that the surface of the tongue may hold pabulum and protection for the development and growth of myriads of bacteria. It is possible that cavities in the teeth, and gums diseased from deposits about the teeth, are more prolific, but probably not.

Out of the "seven nutrient media for bacteria in the oral cavity" given by Miller, five are always present on a coated tongue,—viz., normal saliva, buccal mucus, dead epithelium, particles of food, and exudations from diseased gums.

Formerly physicians were very careful about the examination of the tongue, but at present the diagnostic value of its coating is largely disputed. On the other hand, some of the best physicians make the tongue the principal basis of their diagnosis, especially in gastro-intestinal troubles. But the tongue as a breeding-place for bacteria is properly attracting more attention at present and cannot justly be ignored.

Van Valzah-Nesbet has said, "The tongue is not a mirror of the stomach, as the ancients supposed, but is a local mirror which reflects only that which comes over its surface."

Dr. A. L. Russell says, "The color is due to the pearly color of the cornified epithelial cells covering the papillæ; to retained particles of food; and the *débris* of micro-organisms, broken-down epithelium, and mucus. The color of the organ proper is quite as important as its motions, contour, lesions, and coating. It is well to remember that in perfect health there is usually a slight, uniform coating of a whitish color diffused over the entire tongue, and that towards the base of the tongue in the region of the circumvallate papillæ there is always a heavy coating which is increased with any increase of the normal coating of the anterior portions."

Hare says, "The coating may be black from the ingestion of iron, charcoal, bismuth, ink-berries, cherries, or red wine. It may be stained brown from tobacco, licorice, nuts, prunes, or chocolate. It may be yellow from the ingestion of rhubarb or laudanum."

¹ Abstract of a paper read before the American Medical Association, Section on Stomatology, St. Paul, Minn., June 4, 5, 6, and 7, 1901.

F. Forschheimer says, "In some cases the tongue is of great clinical importance, and in many others its examination for diagnostic purposes is without value. It goes without saying that no case has been completely examined unless the mouth has been looked into, and yet, in a great many cases nothing is gained by this examination. . . . The tongue is affected as the result of local and general conditions. . . . The changes that take place are in the direction of size, shape, color, coating, or fur. The blood affects the color of the tongue, as a whole, more than any other cause.

"The furring of the tongue is that portion of our subject which has been most studied. The fur upon the tongue is, when examined microscopically, seen to be made up of epithelial cells, molecular detritus, and organisms of various kinds, held together by mucus. The organisms are those usually found in the mouth; sometimes we find pathogenic organisms, most frequently the pneumococcus and pus producers."

"In long-continued fevers in which the absence of moisture is the predominating cause we have a peculiar condition of a dry white fur, quite thick and adherent."

"When there is not sufficient movement of the tongue there results a fur, because fewer of the old cells are removed than would be under normal circumstances. In paralytics we constantly see a furred tongue."

"The place of deposit of this fur depends very much upon the size and shape of the tongue; where the tongue does not come in contact with other parts of the mouth it will be thick; at the edge it will be rubbed off, leaving a red outline."

"The most ludicrous mistakes occur to those who overlook the fact that particles of food and medicinal agents give their color to the fur; rhubarb produces a beautiful liver tongue."

The consensus of opinion of the foregoing investigators seems to be that the coatings of the tongue are local and not indicative of any particular disease, and that the mass contains large quantities of bacteria.

These coatings may be accounted for as follows:

The dorsum of the tongue, with its processes, glands, fissures, and rough horny surface, is most favorably constructed for holding detritus from its own surface and from other parts of the mouth, also small particles of food and tartar, but the great factor of the formation and persistence of this coating is mucus. The coating

forms at times into almost a membrane. This is due to the cementing qualities and the insolubility of the mucus discharged into the mouth.

The easily and quickly forming cakes of mucus in the nostrils are accounted for by the continuous passage of air over its surface, drying it rapidly, carrying dust and foreign matter into its substance, where it becomes embedded, causing it to be black, yellow, gray, or other color, dependent upon the character of foreign particles with which the air is freighted, the surface exposed to the air becoming hardest; that next to the membrane is softer. When the mucus finally dries and shrinks it breaks into patches, curls, and drops away, or is removed.

The mucus of the mouth when separated from the more fluid portions of the saliva is just as strong a cementing agent as that of the nostrils, and holds the particles of food, dead epithelial cells, and tartar into a mass or layer, covering the rough surface of the tongue, also cementing the coating to the slanting, filiform processes, and to the uneven surface. Under this layer the mucus is continually secreted, and the desquamation of epithelium goes on; thus the layer is continuously added to from below as well as from above.

The upper surface of the layer being constantly wet has no opportunity to become dry and break up into patches as in the nose. In persistent mouth-breathing it may occur, or portions of the coating may be removed mechanically, producing what is called "patchy tongue."

Such systemic disorders as tend to produce fever have their effect upon the mucous membrane, among the first of which is the "dry stage." In this stage the mucus is thicker, less abundant, and dries quicker. This is as true of the dorsum of the tongue as of any other mucous membrane, hence the coating is usually pronounced and well formed by the time the doctor is called to see the patient.

The color of the coating is largely effected by the incorporation of blood from different parts of the mouth, most frequently from bleeding gums, a condition found in a large percentage of the people at all times, or it may be colored from many sources as cited, and not unfrequently from bacteria.

In addition to personal observation the foregoing would seem strong evidence, to convince one that the coatings of the tongue are

from local causes, but may be favored and increased by febrile conditions which precede or accompany almost every bodily ailment. Lack of cleanliness and mouth-breathing are undoubted and prolific causes.

The danger from unclean tongues and mouths containing decayed teeth and diseased gums are graphically set forth by Miller. He says, "From a neglected mouth, such as repeatedly comes under the observation of dentists, enormous quantities of bacteria must reach the intestinal tract, in spite of the sterilization of food. In a very unclean mouth examined for this purpose I estimated by culture methods the number of cultivable bacteria at 1,140,000,000; many of them were doubtless carried to the stomach during every meal, to be replaced by others developed between meals and overnight.

"Von Kaczorowski proves clearly enough that the micro-organisms in an unclean mouth, quite independent of those introduced with the food and drink, suffice to produce intense fermentative processes, chronic dyspepsia, etc."

Even with decayed teeth and diseased gums to breed bacteria in great numbers, the dorsum of the tongue still presents the largest surface for their growth; and if it is not cleaned once or twice a day (which practically no one does) it is one of the greatest of all places in the mouth for breeding bacteria.

The mucus which cements this layer of sordes upon the tongue is not soluble in water, ether, alcohol, chloroform, or dilute mineral acids, but is soluble in alkaline solutions, and since nearly all of our food is either acid or neutral, and not one in thousands thinks of scrubbing the tongue as a matter of cleanliness and protection, it certainly is a source of danger and infection, and an undoubted condition for perpetuating disease, especially with invalids.

In order to test the solubility of mucus in alkaline solutions, try scrubbing the tongue with a tooth-brush filled with powdered biborate or bicarbonate of soda, and notice how the coat disappears. (Biborate is the least disagreeable.) Protrude the tongue and scrub it from back to front until the coating is removed. When the tongue is to be examined for diagnostic purposes this should be done so that the real color and condition of the tongue can be examined. Then the diagnostic features will be visible and of undoubted value. The use of the brush is much better than to scrape the tongue with a hard instrument. Ordinary tooth-powders

are not satisfactory, because the finely pulverized chalk or other earthy matter remains on the tongue like food and dead epithelium, and the real condition and color of its surface is still unexposed for inspection. Coarse powdered borax or cornmeal, or the two mixed, form a coarse detergent powder very efficient for this purpose, as well as for cleaning the teeth and gums.

A clean mouth undoubtedly prevents much fermentative and putrefactive indigestion, not to mention its comfort and the prevention of tooth-decay and diseased gums.

Animals keep deposits from the tongue by its use as a prehensile organ, and by licking their bodies and other substances. Then the saliva of animals in their native state is decidedly alkaline in reaction, and keeps the mucus dissolved much better than does the human saliva. The latter is either acid or very weak in alkaline reaction, a condition accompanying civilized life, and may be found in animals kept as pets or in confinement and fed upon prepared foods.

There is probably no way of estimating the great immunity brought about by keeping the mouth and all it contains perfectly clean. As a prophylactic measure no physician can afford to neglect it, either for himself or his patients.

SIMPLE GINGIVITIS: ITS ETIOLOGY AND TREATMENT.¹

BY GEORGE T. CARPENTER, M.D., CHICAGO, ILL.

DISEASE of the human gums in these days of advanced civilization is very common and almost universal. In fact, it is a rare thing to find gums that are in all their margins perfectly free from irritation, inflammation, hypertrophy, atrophy, or absorption, and many will show evidence of gingival ulceration. At three previous meetings of this section I have presented papers closely con-

¹ Abstract of a paper read before the American Medical Association, Section on Stomatology, St. Paul, Minn., June 4, 5, 6, and 7, 1901.

nected with the present subject. The conditions then studied were the result of advanced inflammatory or suppurative processes; but by the term "Simple Gingivitis" I include only that condition of the gum margin about the necks of the teeth known as gingiva, that shows the slightest departure from health but is fully established and persistent in its nature. It is the purpose of this paper to take gingival irritation in this simplest form and point out its etiology and treatment, and in this way prevent the subsequent and more serious diseases, which by their certain progress result in pain, discomfort, loss of tissue, and eventually the loss of the teeth themselves. Gingival irritation is liable to present itself at any point where there is a gingival margin. We may find the gingiva of one tooth inflamed and the rest of the gums in a healthy condition. We may find the anterior teeth in a clean condition but affected by gingivitis, while the gums of the posterior teeth, which receive less care, may be in a good healthy condition. We may find gingivitis in some or all of the gums in well-kept mouths, and we may find exactly the same condition of gums in mouths that do not receive the slightest care or attention. We will find this form of inflammation in the mouths of the young, those of middle life, and of old age. We will also find it in the anæmic and emaciated, also in the well-nourished and rugged. This condition, which is found in the human mouth, is rarely found in the mouths of lower animals in their natural state, and from some experiments on the gingiva of rabbits I find that it is almost impossible to establish a gingival irritation without using some powerful infectious or poisonous substance. We also find that in the human mouth where bands, clamps, wedges, or ligatures have caused some irritation, and even laceration, that a gingivitis does not, as a rule, result, so that the etiology of this apparently slight trouble is varied and very obscure. The etiology, or local causes, irregularities, and malocclusion are factors; also imperfect, or loss of, contour, improper use of the teeth, or, more correctly, insufficient use of the teeth, causing lack of tone to the gum; inorganic substances used as dentifrice, causing unnatural or insoluble deposits under gum margins, which is most common in the lower jaw; the injudicious use of toothpicks, floss, and rubber bands, keeping constant irritation at given points.

Constitutional Causes.—A defect in nutrition or cachectic condition may cause an isolated gingivitis at a given point, just as the same condition may produce an aphtha ulcer at any point on the

mucous membrane of the mouth. Improper nourishment, which is the result of too much preparation of food for the teeth and stomach. Plain, coarse, wholesome food that will give the teeth something to do will act as a proper stimulus to the gums and will be kindly received by the stomach. The colored people at the close of the Civil War had mouths with healthy gums and teeth free from caries, but higher civilization, mingled with hotel and restaurant cooking, has so changed conditions that their mouths now are filled with both caries and disease. Careful examination of the mouths of many of the peasants emigrating from Europe have led me to believe that the care of the mouth should be principally through the stomach and a thorough use of the teeth by mastication of food.

Treatment.—Correct all malocclusions and restore perfect contour to crowns. Remove all local irritants and deposits and make a light application of tincture of iodine to affected parts, and give instruction to prevent irritation and abuse of gums; change diet from mashed vegetables of all descriptions, or soaked or cooked in milk, for dry or Swedish toast, whole wheat, or grape-nuts to grind thoroughly fine with the teeth, incorporate with the saliva, and swallow. This treatment should be followed, especially with children suffering from gingivitis.

I am indebted to Dr. M. H. Fletcher, of Cincinnati, for the suggestion of cornmeal as a dentifrice. I think, as a partial substitute for thorough mastication, that a good cereal dentifrice is very beneficial, using corn, oats, cream of wheat, or any coarse and grainy substance, and brush the teeth and gums vigorously after each meal and before retiring, giving a half rotation to the brush. The mouth should be thoroughly rinsed after each brushing, as there is some difficulty in removing the cereal. I do not approve of the use of a very stiff brush without a dentifrice, and I consider the place for all inorganic dentifrices is on the outside of the mouth. They may serve a good purpose for cleansing metals and marble, but should not be used on organized tissues.

PLAN AND SCOPE OF AN INTERNATIONAL DENTAL CONGRESS DURING WORLD'S FAIR, 1903.

BY DR. BURTON L. THORPE.¹

THE Louisiana Purchase Exposition will demonstrate to the world the advancement of civilization and the achievements, not only of American citizenship, but of the world's progress.

The best workers in science, art, philosophy, literature, agriculture, trade, and labor will mass and compare the returns of their labors.

American dentistry is recognized the world over for its superior achievements. No profession has made greater strides in scientific research, or attained higher excellence from an artistic or humanitarian stand-point than has our profession. It is, indeed, fitting that dentistry, occupying the high place that it does in science and art, should be represented, as will be all the collateral sciences, in a congress of the progressive dentists of the world, who will come together for professional, scientific, and social purposes, demonstrate the latest methods, and compare results.

The Missouri State Dental Association, believing such a congress would be of great benefit to the profession, has taken initiative steps in this matter by appointing a committee of seven St. Louis dentists, composed of Drs. William Conrad, M. C. Marshall, F. F. Fletcher, Walter M. Bartlett, L. G. McKellops, J. H. Kennerly, and B. L. Thorpe, who have begun the preliminary work, to be followed by the National Dental Association, which will have full charge of the congress.

At the request of Mr. John Schroers, chairman of the Committee on Education for the Louisiana Purchase Exposition, I present the following suggestions as to plan and scope:

The plan followed by the World's Columbian Dental Congress at Chicago in 1893 should be followed, except that a director-general for this congress should be appointed, who would have full charge of all arrangements and devote his whole time to the work of organization.

He should be a man of national reputation, conversant with

¹ President Missouri State Dental Association.

details, and able to handle the entire work in a business-like manner. The other officers should be a president, vice-president, secretary-general, and assistant secretaries who possess linguistic abilities, and a treasurer. The main committees should be an Executive Committee, Committee on Finance, Committee on Arrangements, Committee on Invitation, Committee on Printing, Committee on Transportation, Committee on Programme, Committee on Exhibits, Committee on Registration, Committee on Reception, Committee on Education and Literary Exhibits, Committee on Applied Sciences, Committee on Conference, Committee on History, Committee on Nomenclature, Committee on Prize Essays, Committee on Pathology, Committee on Biology and Bacteriology, Committee on Appointment of Dental Surgeons in Armies and Navies of the World, Committee on Care of Teeth of the Poor, besides numerous minor committees. The programme should be presented in sections, each topic classified, thus avoiding confusion, to consist of essays and lantern lectures on anatomy, history, etiology, pathology, bacteriology, chemistry, metallurgy, therapeutics, materia medica, dental and oral surgery, operative and prosthetic dentistry, orthodontia, education, legislation, literature, and clinics by expert operators, to demonstrate the latest methods of operative procedure in dental and oral surgery. The exhibits to consist of biological, bacteriological, and pathological, and the newest improvements in instruments, appliances, and materials. The time between sessions to be devoted to such entertainments as excursions, garden-parties, conversations, receptions, luncheons, and a banquet.

The World's Columbian Dental Congress held at Chicago had a paid membership of one thousand and seventy-four, and was self-sustaining. The St. Louis Congress will likely double the membership of the Chicago Congress.

The following of this plan, with the addition of such features as may be deemed advisable, would give to our profession a great meeting of much benefit to all attending and to the dental world in general.

Reviews of Dental Literature.

A CONTRIBUTION TO THE STERILIZATION OF DENTINE IN LIVING AND DEAD TEETH.¹ By J. Choquet, D.E.D.P., F.M.P. (Paris).

Two years ago, at the Annual Meeting of the British Dental Association, held at Ipswich, I announced, when I presented the tubes of culture of micro-organisms obtained from dental decay, that before long I would prove that it is possible to stop the pathological process of this affection. It is these results I shall have the honor to present to you to-day.

Allow me first to remind you that the researches I have made on dental decay are quite different from those made till now by the many pioneers who have worked on the same subject. I have been the first to point out the truth of the theory advanced by Galippe and Miller that the destructive process of dental decay can continue under good fillings, and that notwithstanding all the care taken in the preparation of the cavities, notwithstanding the white and healthy aspect of the layer of dentine covering the pulp. It is thanks to the micro-organisms acting in time that I have succeeded in reproducing the disorders inherent to the affection upon a living animal, the sheep.

And to begin with, what must we understand by these words, sterilization of dentine?

Why, if we have taken every precaution in the preparation of the cavity, does this destructive process continue?

The reason for this is that, in the layer of dentine supporting the filling, and which, when examined microscopically, seems white, hard, and healthy, some microbic germs have still remained in it. These, on account of their anaërobic properties, finding in the contents of the dental canaliculi the necessary materials for their development, have continued to increase slowly, insensibly, at the same time occasioning the disorders every one knows. That is, if you like, a kind of the latent microbism of Verneuil.

Well, ideal antisepsis, as we understand it, means the whole of

¹ Read at the annual general meeting held in London, August, 1901.

the manipulations we have to effect in order to kill or at least diminish these micro-organisms before they have succeeded in reaching the pulp. One of our French colleagues, Dr. Mahé, has, I think, very well understood the question as we must understand it, He says,—

“The pulp has been accessible to the septic agent, and it is not, or it is no longer so to the antiseptic agent.

“The same layer of dentine which has been for the infection a ridiculously insufficient barrier, rises all powerful before the therapeutic agent.”

In our opinion, it is impossible to place the question more clearly and more precisely, and that is the point on which we have to direct our attention more especially. That is, “allow the therapeutic agents to penetrate this barrier of dentine which is considered as impassable.”

Without wishing to go into the details of all the processes successively used for the disinfection of dentine, whether we have to deal with the second or fourth degree of caries, let us remember, however, that long before microbes were spoken of, and consequently antiseptis, certain practitioners were accustomed, before filling, to paint over the cavities with a liquid of some kind. Why did they act so? It would be very difficult to answer this question. But these practitioners seemed to foresee the antagonistic action which microbes and antiseptics would have to play later. In any case, they thought that such a precaution, if it did not do any good, could not do any harm.

Then we had Pasteur's discoveries, afterwards those of Miller on ætio-bacteriology of dental decay. Immediately they thought of profiting by the antiseptic agents, and you know how small our therapeutic arsenal was at that time.

Certain practitioners thought of using carbolic acid, creosote, zinc chloride for the disinfection of their cavities, and they did that without thinking if any one of these liquids would penetrate the dentine (and this most often did not take place, as we shall see later), or supposing the contrary, if the liquid used did not go beyond the aim they had in view.

They thought only of one thing, to kill the microbes, without troubling themselves if at the same time they killed the cellular elements.

Gradually, as chemistry was developed, new antiseptics were

added to those existing already. I will remind you, for the sake of argument only, that in America two quite opposite camps were formed about ten years ago for the disinfection, the sterilization of dead teeth. These two camps were formed of the partisans of the coagulant antiseptics and those for whom mere coagulants represented a perfect antiseptic. However, notwithstanding all the papers published, and the experiments made in the most conscientious manner, it has not yet been fully proved that there was really penetration and consequently absorption of the medicament destined to disinfect the dentine.

What is the reason for the bad results obtained? Simply that the medicaments used for the sterilization of the cavities of *living teeth* were used, so to speak, groping in the dark.¹

This was, moreover and above all, because those who wished to obtain the sterilization of the cavities by washing them did not work in the laboratory, or, if they did so, they did not put into practice for the subject we are speaking of the rules inherent for the good preparation and conservation of histological preparations. The laboratory has been criticised, and very often it happens that serious people reason as follows: Laboratory? What is the good of that? Do you think that the experiments you make there can be of any use in daily practice?

Well, I wish to prove that the laboratory *is* useful in every-day practice, and that it is not only useful but absolutely indispensable to the persons who wish to work scientifically and practically, and that the results obtained *in anima vili* or *nobili*, according to the case, are only the results of the experiments made *in vitro* in this same laboratory. Without going farther, why are the experiments in the sterilization of living dentine defective when carbolic acid

¹ Dr. Choquet does not add anything to the value of his paper, which is freely acknowledged, by belittling the work of others. The "two opposite camps in America," as he chooses to designate those who favored two quite different methods for the sterilization of the tubulated structure of dentine, performed very extensive laboratory work, and, so far as the writer was concerned, he demonstrated both macroscopically and microscopically the penetration of coagulants throughout the tubes. Dr. Choquet's method may be new, but if his dictum, that microbes penetrate the tubes beneath fillings, be true, then all fillings should prove a failure unless antiseptic processes are previously followed. This latter is quite a modern method, and yet fillings prior to the adoption of this preserved teeth from caries. His conclusions are not sustained by clinical experience.—ED.

is employed, and when alcoholic antiseptics or the great majority of essential oils are used?

To this question we answer by saying that to wish to make one of the antiseptics above mentioned penetrate the dentinal canaliculi without having submitted the dentine previously to a special treatment is to wish to dissolve oil in water by simply floating it on the surface. It is to wish to clear a section of tissue obtained by freezing (that is to say, without any inclusion, and consequently aqueous, hydrated) by floating it directly in a bath of one of the clearing agents employed in histology. What will take place in that case? The section, however fine it may be, will remain in vain an indefinite time in that clearing agent: the water will never be driven out by the clearing agent.

On the contrary, if we dehydrate in a progressive manner this section of tissue by using alcohol of different strengths, and gradually stronger, we shall see it become clear and transparent when taken out of the liquid and put into a mixture of alcohol and clearing agent. The phenomenon observed for this section of tissue must be the same for the preparations to which we must resort, this barrier of dentine penetrable by microbic agents, but at the same time considered by Dr. Mahé as impossible for the therapeutic agents.

Before filling a cavity we must act in the following manner: (1) To clean the cavity as much as possible till we remove every portion of softened dentine; (2) dry the cavity and wash it with alcohol at seventy per cent.; (3) wash the same with absolute alcohol; (4) use a mixture of alcohol and toluol for washing the cavity; (5) dry and fill.

When I began the first experiments I could not, it is easily understood, do them in the mouth of my patients, so I was obliged to work in my laboratory. To make my experiments upon freshly extracted teeth did not please me on account of the density which exists between the different organs I had to work upon. So I thought it much better to act upon tissues approaching the nearest to the human dentine, and I began to work upon a hippopotamus tooth. I turned a few cylinders of ivory representing three or four centimetres in height and one in width, and with round burs I hollowed a fairly cylindrical cavity of two centimetres deep. I used one of these cylinders dry, and the other after having remained during an hour in a solution of chloride of sodium at one per cent.

Then I dried as much as I could the external portion with a linen rag and placed in the cavity a mixture of toluol and alcohol, to which I had added some methylene-blue. The same quantity of liquid was placed in the dry cylinder we shall call A and the moist one B. After five minutes in A I could see on the peripheral borders a slight blue tint, whilst nothing was apparently visible in B. Then I threw away the liquid of the two cylinders, washed them in water, and cut them longitudinally. As you can see, the cylinder A is almost wholly crossed by the staining agent, while in the cylinder B this staining is exclusively visible in the periphery of the cavity.

What are the conclusions we can deduce from those cylinders and teeth, from those dead and living tissues? The following: A layer of dentine which is not penetrated by certain liquids when it is moistened is entirely penetrated by the same agents if it has previously undergone certain preparations, as we have indicated before. Let us now consider how we can succeed in making an antiseptic penetrate the dentinal canaliculi, how we can prove the presence of this in the mass, and above all, how we can be assured that this antiseptic has performed its bactericidal properties. But before doing so allow me to make a little digression, and let me give to Cæsar what is Cæsar's. The first experiments I tried for the sterilization of dentine I performed in February, 1895, and when I published my first paper three months ago I thought I was the only one working in this way. (If I refer to my note-book I see I have treated since that time seven hundred and ninety-two teeth by the method indicated later, and I have not had any failures.) I was rather disappointed a few weeks ago, when making some bibliographical researches, to find in the copy for May, 1898, of the American journal, *Items of Interest*, an interview with the president of the Microscopical Section, my excellent colleague, Dr. J. Leon Williams, in which he claims to carry out nearly the same treatment as I do, but with this difference, that he does it for the *softened* dentine.

The priority always belonging to the person having made known through the scientific press a process of some kind, I must give precedence to Dr. J. L. Williams. I do not know in what year he began his researches on this subject, but, as I stated, mine began in February, 1895, the time when I first used hydronaphtol dissolved in alcohol and xylol. It is only gradually and by feel-

ing my way that I arrived at the actual method that I am about to speak of. In any case, one point remains assured, I not only seek to sterilize softened dentine, but also and above all dentine seemingly healthy, and so I continue to work on the subject I have chosen, that is to say, to prevent the continuation of decay under good fillings. Besides, and above all, I am the first to have proved in an indisputable manner, by means of a very precise chemical reaction, (1) the penetration of the antiseptic into the dentine; (2) the complete sterilization of the latter.

It often happens that two authors come to the same results at the same epoch, without knowing each other. This was what happened in the case of Pasteur and Sternberg concerning the discovery of the pneumococcus. Pasteur published his results in the *Bulletin de l'Académie des Sciences* in January, 1881, whereas Sternberg, who had arrived at the same results without knowing of the experiments of Pasteur, published his, in the same year, in the April number of the *American Journal of Medical Science*.

Does it follow that Sternberg's work was of no value? Certainly not, since the results obtained were exactly the same. It is therefore the same thing in my opinion for the subject we are speaking of, with the only difference that, if Dr. J. Leon Williams was the first to publish in an interview his process of treatment of *softened* dentine for its sterilization, I am the first to have proved the complete sterilization, not only of softened dentine, but of the dentine covering the pulp, and containing always, notwithstanding its healthy look, great quantities of micro-organisms, showing themselves in course of time.

With this understanding, let us see again how we are to operate in order to obtain a perfect sterilization. (1) Mechanical cleansing of the cavity; (2) dehydration, not with very hot air, but cool air, to which is added afterwards the energetic action of alcohol of different strengths; (3) dry, with hot air, and substituting a mixture of alcohol, xylol, geranium essence, and hydro-naphtol for the alcohol alone. We have two ways: either the filling may be done in the same sitting, or it will only be done twenty-four or forty-eight hours after.

CASE I.—The filling is done immediately when we have a rather small cavity, in which it is not possible to fix a temporary stopping.

CASE II.—The filling is accomplished only after twenty-four

hours' time, during which a dressing of the mixture above described is left in the cavity, after having covered it with gutta-percha or wax. We can with great advantage make a paste with hydronaphtol and put it in the bottom of the cavity, in which it is retained by the dressing moistened with the liquid, and this covered by gutta-percha. There is a point to which we must draw special attention. When once the manipulations are begun, the saliva must be prevented from coming in contact with the cavity. Having seen the results obtained by experiments on the blocks of ivory I have already described, I wished to see what would happen in living teeth *in situ*. For this purpose I extracted two teeth, after having placed for five minutes in their cavities the same dressing used for the ivory blocks. One of these, a first right upper bicuspid affected with pulpitis, was submitted to dehydration by heat and alcohol of different strengths; it was soaked through. The other, a right upper wisdom-tooth growing outward, was treated only by burring. The dressing remained the same time as for the bicuspid; the staining reagent, however, did not soak in, but remained exclusively on the sides of the cavity. The experiment is therefore conclusive. When once I was sure that the penetration would be effected in the whole of the organ, I sought to see if the antiseptic employed also penetrated. I made a first experiment on blocks of ivory prepared in the same way as the other two, but with the difference that hydronaphtol was used instead of methylene-blue. The liquid was placed in the cavity and covered with a pad of wax during twenty-four hours. After that time, the cylinder was cut longitudinally, freed from the liquid, dried in the incubator, and examined with regard to the chemical reaction. The reagent employed is acid nitrate of mercury, which possesses the property, when placed upon a section of dentine, of staining it in a manner differing according to the presence or absence of hydronaphtol.

In the first case the reaction obtained is a dark yellow, whereas in the second it is pink.

I wished to see on a tooth that was to be extracted what would be produced. Here is a right upper lateral incisor having occasioned a great many abscesses, and moreover suffering from pyorrhœa. I entirely emptied the pulp-chamber, and after having operated as described, I left, during twenty-four hours, a wadding of the hydronaphtolized liquid, covered with a gutta-percha stop-

ping. Acid nitrate of mercury shows us that the whole of the root is soaked through and especially the apical portions.

We had still to prove that this hydronaphtol acted efficaciously as an antiseptic on the micro-organisms contained in the dentine, whether healthy or softened.

Two sorts of experiments have been made on this subject: (1) Decayed teeth occasioning a defective dental arch have been extracted after having been submitted to the treatment as described during twenty-four hours, some of them having been submitted to the treatment indicated, and the others after a slight and simple dehydration with the aid of warm air. (2) Experiments have been made on living teeth treated in this manner, and which have been stopped for one, two, and three years; and in which I had been obliged to leave a thin layer of yellow dentine over the pulp.

CASE I.—Left upper first bicuspid. Decay in the second degree, mesial surface; the cavity is cleaned as thoroughly as possible; nevertheless there remains a portion of yellow dentine. I dry, after using alcohol at seventy-five per cent., eighty per cent., and ninety per cent., and absolute as a dressing during twenty-four hours, and stopping with gutta-percha. Extraction: the tooth is passed in the flame of alcohol without having taken off the gutta-percha, is enveloped in sterilized paper, and broken in a vice. The pieces sown in the different nutrient media, both solid and liquid, in the air and in the vacuum, did not grow at all. Right upper wisdom-tooth; decay of the crown. Mechanical cleaning and simple drying with warm air. No alcohol used; same dressing and manual treatment as before. Development in every nutrient medium, and much more rapidly in the liquids.

CASE II.—(a) The rubber dam having been placed on the first right upper molar filled with cement in 1898 on the mesial side, the cement is taken out with burs. When the cavity is quite empty I use round burs, previously passed in the flame of an alcohol lamp, dust of dentine being still yellow, but quite hard. I inoculate this dust in different media; nothing developed.

(b) Right upper central incisor, distal side, filled in July, 1899. Same operation; same negative result as to development.

(c) Right lower first molar, filled on the grinding surface in January, 1900. Same pro-manipulation; same negative results.

From all these observations it results that dental decay may be

easily stopped by employing precise methods, and that we have no longer to fear at present the continuation of the destructive progress under good fillings.—*Journal of British Dental Association.*

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A MEETING of the Institute was held at the office of Dr. E. H. Babcock, No. 140 Remsen Street, Brooklyn, N. Y., on Tuesday evening, June 4, the President, Dr. J. Morgan Howe, in the chair.

The minutes of the last meeting were read and approved.

Dr. C. O. Kimball.—I was asked a short time since by the members of the family of the late Dr. Dunning to prepare a little sketch of his life for publication, and at the request of the officers of the Institute I will read it to you. I have here a copy of a crayon portrait of Dr. Dunning, taken in his prime by one of his artist friends, and reproduced by photography within the last year. It may interest the gentlemen here to know that Dr. Dunning's grandson, one of our *confrères* in the city, is with us to-night, and has with him an old hand-glass used by Dr. Dunning. It has on the reverse side, engraved in the silver back, a list of Dr. Dunning's charges for operations when he began his work in New York nearly sixty years ago. It is a rather interesting memento which Dr. William B. Dunning has been kind enough to bring with him.

See page 808 and frontispiece.

The President.—We are very much obliged to Dr. Kimball for this sketch of Dr. Dunning's beautiful life, and also to Dr. William B. Dunning for showing us this article which Dr. Dunning, Sr., must have handled so many times.

We will, without waiting for other communications, proceed to the further order of business, which will be a paper by Dr. D. D. Smith, of Philadelphia.

(For Dr. Smith's paper, see page 817.)

DISCUSSION.

The following letter was received from Dr. Marshall:

"The announcement of the June meeting in your Institute of Stomatology is at hand. The special subject up for discussion,—namely, Oral Prophylaxis,—is one that interests me very greatly, and I should be exceedingly pleased if I could be present at the meeting. I feel that upon this particular line our profession must do more work than it has done if we are ever to succeed in effectually stemming the tide of the rapid decay of the teeth of the present generation. We must, however, go deeper than mere local treatment for the prevention of caries and other oral diseases. We must begin with the mothers before the children are born, and follow it up throughout the period of the growth and development of the child. Little children should begin the cleansing of their teeth as soon as they are able to hold a tooth-brush; but if the teeth are defective in development, the task of preventing disease and repairing its ravages is much greater than would be the case if the teeth were perfectly developed.

"I shall look with interest for the report of this meeting in the dental journals.

"Very truly yours,

"JOHN S. MARSHALL."

Dr. Smith presented to the Institute some cases from his private practice illustrating the results of his methods of treatment.

Dr. Smith.—Gentlemen, it has been suggested that I have not been sufficiently explicit in describing methods. I do not know whether I can meet your desires in this direction, as it is something which each individual must acquire for himself through practice. It is all-important to bear in mind that the tooth has not only labial and buccal surfaces, but lingual, palatal, and approximal surfaces as well, *all of which must be thoroughly treated*. I accomplish this by means of these little porte-polishers; they are a modification of the old Jack porte-polisher, and are now manufactured by J. W. Ivory, of Philadelphia. I keep eight of them with different shaped points ready for use. For the better protection of this instrument, the shaft inside the handle should be coated with white petroleum, which is a very excellent preservative for the steel, and thus very serviceable. These sticks are charged thor-

oughly with such pumice-stone as we ordinarily use for polishing purposes; it should not be too fine. A pumice with some grit is the best. The polishing should be done with considerable pressure, this being an important part of the operation. "How do you polish between the teeth?" is often asked. This can be done with the sticks with points thinned and shaped to suit the conditions. It cannot be done with silk or tape or with anything that I know of as well as with these same orange-wood sticks.

In pyorrhœa cases I have a remedy of my own which I call *Zhongira*, and which I have been prescribing with great satisfaction for eighteen years. The principal ingredient of this preparation is *zinci chloridi*. I should like to have any of the gentlemen present take one of these bottles and try it. I use it full strength for pyorrhœa and dilute about one-half for a mouth-wash.

Dr. Allan.—When the approximal surfaces are touching, what method do you use? Can you then polish between the teeth with a stick?

Dr. Smith.—I use the sticks exclusively. I find that in the progress of the treatment the sticks will go in between the teeth in a way to effect a perfect change of environment.

Dr. Allan.—Do you place the sticks in the hands of the patients?

Dr. Smith.—No. My patients use the brush only. And just here a word may be said about brushes. There are a great many badly shaped, inefficient, and unsatisfactory tooth-brushes, as there are many worthless tooth-powders. There is perhaps no better tooth-powder than that known as Caulder's dentine. There is also an excellent dentifrice sold under the name "Odontine."

Dr. Allan.—Do you put any pumice in your tooth-powder?

Dr. Smith.—No. I think pumice should be used only by the operator.

Dr. S. E. Davenport.—Dr. Smith has mentioned benefit coming to the gums and alveolar process by this special treatment of the teeth. I would like to ask Dr. Smith whether this benefit derived by the gums in this treatment is entirely indirect because of this treatment to the tooth-surfaces, or whether he gives any special treatment to the gums themselves and through them to the alveolar process.

Dr. Smith.—No, gentlemen, I do not give the gums any special treatment; the excretion from the gums collecting around the

necks of the teeth is removed in this treatment, and thus they are greatly benefited. If you will allow the illustration, the finger-nails neglected and left from week to week with indifferent washing only, will show a condition not unlike gum tissue which is irritated by the perpetual presence of this foreign toxic matter. The nails must be polished to keep them in a proper condition. It is the same with the teeth. When we remove this excretion which comes from the gums, we benefit not only the gums but the alveolar process as well.

Dr. Allan.—About how much time did you put upon the teeth of the gentleman whom you have presented to us to-night?

Dr. Smith.—Before answering this last question, I should like this gentleman to make a statement, if he will, of his personal feelings in regard to his condition.

Statement.—I came to Dr. Smith on the 19th of March with my mouth in very bad condition, especially my gums. They had been treated for pyorrhœa alveolaris for a long time. I think I had this disease in a modified form at twenty-five. My last dentist claimed that it was constitutional in origin, and treated it accordingly. At first I thought I received some benefit, but in the end it amounted to nothing.

Dr. Allan.—Did he use any instrumentation?

Well, I was very much disappointed with his instrumentation; indeed, at the same time that I was going to the gentleman named I used to go to another doctor to have the tartar removed, because I thought the first doctor was not thorough enough. My mouth has been perfectly comfortable since I have been under treatment by Dr. Smith.

Dr. Kimball.—At what intervals has this mouth been treated?

Dr. Smith.—The treatment at first consisted in thorough removal of all foreign matter on and about the teeth and roots, the mouth being frequently rinsed with phénol sodique, full strength. For two weeks I saw the patient three times a week, each time going over *all* the surfaces of the teeth and down into the pus-pockets with the sticks and pumice. Bleeding, which was quite free in the beginning, soon ceased entirely, and the gums began to take on a normal condition. Each time after polishing out with the stick and pumice the pockets were touched with deliquesced *zinci chloridi applied with a stick*. At the end of two weeks the treatment was changed to twice a week for four weeks, when it

was reduced to once a week, and this has been continued to the present time, interrupted only by a very few necessary absences from the city. When he first presented, a thick, gummy, mucoid secretion would quickly recement itself on the teeth after its removal. This condition is now apparently cured. This frequency of cleansing is one of the points upon which I have been criticised, some maintaining that it will result disastrously to the gums. I assure you, gentlemen, that it will do no harm. The excretion from these diseased gums must be removed, and that frequently.

Dr. Kimball.—Do you use any obtundent in extremely sensitive cases?

Dr. Smith.—I do not use anything at all except phénol sodique. I have never found a case I could not treat without special pain. Patients find great comfort and relief in using the “Zhongira,” to which allusion has been made.

Dr. F. Milton Smith.—Do you employ the engine?

Dr. Smith.—Most decidedly, no.

Dr. Eames.—Do you polish way down to the end of the pocket, or do you expect the pocket to close?

Dr. Smith.—I polish the pockets gently but thoroughly. It is a question if the gum structure will attach itself to the tooth, but if it does not, there will be a reshaping of the process and gums so as to obliterate the pocket.

Dr. F. Milton Smith.—May I ask your reason for never using the engine?

Dr. Smith.—Because the desired results cannot be obtained with it.

Dr. F. Milton Smith.—As I understand this treatment it consists of thoroughly cleansing the teeth, followed by what Dr. Smith calls massage, which consists of rubbing the surfaces of the teeth. If this is the case, I cannot see why it cannot be accomplished in a time-saving way by the use of the engine.

Dr. Smith.—It is a mistake to attribute the use of the term massage to me in this connection. There is no saving of time in using the engine for this treatment, and the beneficial effect of stimulation to the tooth is lost. Were not this the case, it is an absolute impossibility to get any wheels run by the engine to do the work that is done on the labial, buccal, lingual, and palatal surfaces, as well as between the teeth, by these properly shaped sticks charged with pumice and intelligently and skilfully handled in

these little porte-polishers. If the position of the teeth and their surfaces permitted the use of *wheels* for this purpose,—which they do not,—the resistance interposed by the involuntary muscular contraction, in which the tongue, lips, buccinator, and the floor of the mouth all join, would surely defeat that thoroughness in the operation which contemplates complete change of environment, and thorough polishing of the teeth.

Dr. A. H. Brockway.—I have greatly enjoyed the talk of Dr. Smith, and have also read with profit his articles in the journals on the same subject. I think he is on the right track, and I am an easy convert to his idea, for I have long believed in the efficacy of frequent polishing of the teeth. But it will be observed that Dr. Smith goes farther than simply cleaning the teeth; his idea is to produce by his manipulations a stimulating effect, as it were, to the vitality of the tooth, thus better enabling it to resist pathogenic influences. This seems plausible, and if it be so it is indeed very important.

Dr. Kimball.—Mr. President and gentlemen, it has been a very pleasant thing to me personally to hear this talk from Dr. Smith, and I think it has been an exceedingly instructive one to us. My mind has gone back very naturally, under the circumstances of the evening, to my preceptor, Dr. Dunning, whose portrait is before you; again and again his instructions to me have come to mind: the same care in using the stick; the same thorough system of cleansing the teeth frequently—though not so frequently as Dr. Smith has done—with orange-wood sticks held in the porte-polishers and pumice-stone, producing healthy reaction by diligent rubbing, with the result that I have been surprised in my own practice to find how few cases of pyorrhœa alveolaris I have seen. It is but a few years since I remarked to a friend that I had never seen a case of pyorrhœa alveolaris in my practice or in that which I had inherited from Dr. Dunning, because of this system of cleansing teeth which he taught and which we are endeavoring to carry out.

Dr. Smith goes farther in this, that the same care has been carried on at more frequent intervals. As I reason carefully upon Dr. Smith's statements, I think he has seen the wisdom of following this cleansing at sufficiently short intervals to prevent the reformation of this deposit on the teeth, and that it is for this special point that we have to thank him; not only the removal

of the deposit, but following it up with sufficient frequency to bring about a correction in the general condition of the mouth. As regards the use of floss-silk for polishing between the teeth, perhaps if he had tried using floss-silk folded three or four times and thoroughly waxed with yellow beeswax he would find that then, with powdered pumice-stone and water rubbed into the waxed silk, he would be able to polish between the teeth very thoroughly. In this manner you can polish down under the folds of the gum. I fully agree with what Dr. Smith says about the use of the hands. My son is now a student. I shall not allow him to use the engine until he can work thoroughly well by hand. I do the same with the young men in my office. I do certain parts of this work with power-polishers, but I do it with the experience of years in using pumice-stone with sticks held in the hand. I find that after I am through with the power-polishers I am very apt to get my stick and go around in the out-of-way places, using power for the places that can be reached easily and the stick in the difficult places.

And now I wish to offer, on behalf of the Executive Committee, a most hearty and cordial vote of thanks to Dr. Smith not only for his coming here to-night, but for the great pains he has taken to prepare for us. I move you, Mr. President, that a cordial vote of thanks be extended to Dr. Smith for his excellent paper; and also that we tender our most sincere thanks to his patients for coming here and showing us this beautiful work.

Dr. Smith.—I thank you very much, gentlemen, for so patiently listening to what I have been permitted to say here this evening, and I sincerely hope the future will disclose that it has not been altogether in vain.

Adjourned.

FRED. L. BOGUE, M.D., D.D.S.,
Editor The New York Institute of Stomatology.

AMERICAN MEDICAL ASSOCIATION, SECTION ON
STOMATOLOGY.

DISCUSSION ON PAPER ON "MILITARY DENTAL PRACTICE: ITS MODIFICATIONS AND LIMITATIONS," BY HENRY D. HATCH, NEW YORK CITY.

(For Dr. Hatch's paper, see page 749.)

Dr. Eugene S. Talbot, Chicago.—When this paper was received from Dr. Hatch it seemed a subject a little out of the general order, and hence that it would be wise to write to Dr. John S. Marshall, president of the Examining Board of Dental Surgeons, United States Army, and have him discuss the paper. His comments will now be read by Dr. A. H. Peck, of Chicago:

MR. CHAIRMAN AND MEMBERS OF THE SECTION ON STOMATOLOGY,—The passage of the Army Reorganization Bill with its section creating a corps of dental surgeons for the United States army makes an epoch in the history of modern dental surgery; an epoch which has never had its counterpart before in the history of the world, the influence of which is destined to be far reaching in its beneficent results, and of great importance in the elevation of our educational and professional standards.

When we take into consideration the fact that modern dentistry covers, in its growth and development, a period less than the lifetime of many individuals, we have good reasons to be proud of its achievements. Sixty years ago there was no such thing in existence as a dental college; a dental journal had not been thought of, nor a scientific dental society organized. The practice of dentistry at this time was, with few exceptions, in the hands of the barbers and blacksmiths. The few earnest, scholarly men who had entered its ranks were desirous of lifting their specialty out of its low estate, and by education and scientific training make it an honorable and worthy calling. In this endeavor, however, they met with no encouragement at the hands of their *confrères* in the medical profession, but, nevertheless, with these great odds against them, engendered not by malice, but by the narrow view taken by those unfamiliar with the capabilities and possibilities of development which lay in this infant specialty, they moved forward and laid the foundations of what has proved to be one of the greatest specialties in the whole field of medicine.

We have special reason for congratulation also in the fact that the Congress of these United States was the first legislative body in the world to formally recognize the *value* and *need* of the beneficent services of our specialty as a department of military medical practice, and that we have been given an opportunity to prove the wisdom of its action to our country and the world.

The whole question, however, of placing dental surgeons in the army was looked upon by many of our national legislators in somewhat of the light of an experiment, and in a certain measure this is true of the War Department and of the Surgeon-General. For this reason, when the bill was framed it was thought best to provide for the organization of the Dental Corps upon the contract system, as by this system it would be an easy matter to discontinue it if it should prove unsuccessful; while, upon the other hand, if its service was a success, and found to be an indispensable part of army medical practice, the Corps could be made permanent by amending the law so as to make its members commissioned officers.

The examinations of the Dental Corps and the selection of the outfits have been placed in the hands of an Examining and Supervising Board of Dental Surgeons, subject to the approval of the Surgeon-General and the Secretary of War. These officers have invariably sustained the board in all of its work; have given them every facility asked for, and rendered every assistance possible in planning the organization of the Corps and insuring its future success in the field.

European nations will be interested in the plan of organization of our Army Dental Corps, of its personnel, and in the results of its professional services. Upon the success or failure of this enterprise will depend in a large measure the introduction of a similar service into the armies of other nations. It is to be hoped, therefore, in the interests of humanity, that it may prove successful.

I have been interested in reading the paper of the essayist, and feel like complimenting him upon his apparent grasp of the subject under discussion. His suggestions as to the modifications and limitations of military dental practice are in many respects good, but it will not be necessary to confine army practice within such narrow limitations as he has outlined.

The general suggestions which he has made, and many more of a specific nature, have formed the subjects of much earnest con-

sideration upon the part of Surgeon-General Sternberg and the Examining and Supervising Board, and not until each question has been carefully weighed and the consequences of its adoption or rejection examined from all stand-points has final action been taken. The progress of organization has been necessarily slow, for there were no established precedents to guide the board in its actions and no past experience to enlighten it. It has, therefore, been obliged to begin its work at the very foundation, striving to lay this *firm* and *sure*, and then gradually to rear upon this the superstructure of a finished organization. The organization of the Dental Corps is yet in the experimental stage; the authorities must, therefore, carefully feel their way and adapt the service to the peculiar demands of military life and movements, making such changes from time to time as experience and foresight shall dictate.

With the approval of the Surgeon-General, I herewith present in brief outline the plan upon which the Army Dental Corps is organized. This outline comprises:

1. The official status and pay of the army dental surgeon.
2. The examination of candidates.
3. Assignment to duty.
4. Regulations governing the Dental Corps.
5. The supply table.
6. Nosological table and system of keeping records.

THE OFFICIAL STATUS.

The army dental surgeon belongs to the regular establishment, and, according to the law which created the Corps, he will serve the officers and enlisted men of the regular and volunteer armies. He is employed as a contract dental surgeon, having the *relative* rank of a first lieutenant. His pay is one hundred and fifty dollars (\$150) per month, and quarters when serving with troops. All instruments, apparatus, and materials that are necessary for conducting his practice and performing his official duties are furnished by the Medical Department.

EXAMINATION OF CANDIDATES.

The examinations consist of (a) physical condition; (b) written and oral questions upon the studies of the dental college course;

(c) practical demonstrations in operative dentistry; (d) practical demonstrations in prosthetic dentistry.

(a) The physical examination is conducted by an army surgeon detailed for this purpose, and upon the same general lines as those in vogue for entrance into the other departments of the army. Perfect health and freedom from physical defect are necessary to pass this examination; but defective eyesight which can be corrected by appropriate glasses does not debar the candidate.

(b) Written and oral examinations are conducted upon the following-named subjects, and the candidate must attain a general average of seventy-five per cent. upon each of them: Anatomy, physiology, histology, chemistry, physics, metallurgy, dental anatomy and physiology, dental materia medica and therapeutics, dental pathology and bacteriology, orthodontia, oral surgery, operative dentistry, prosthetic dentistry.

(c) The practical examination in operative dentistry consists of: 1. Examination and recording the condition of the mouth and teeth. 2. Preparation of cavities (a) by hand instruments; (b) by engine instruments. 3. Instrumentation and technique. 4. Preparation and manipulation of filling-materials: gold, tin, amalgam, gutta-percha, oxyphosphate, cement. 5. Inserting and finishing of fillings. 6. Treatment and filling of root-canals and preparation of root for pivot crown. 7. Manipulative technique in removal of calcareous deposits. 8. Application of rubber dam, metallic separators, matrices, etc. 9. Diagnosis, prognosis, and treatment of oral diseases. 10. Care of and sterilization of instruments and hands.

(d) The practical examination in prosthetic dentistry comprises: 1. Impressions, casts, bite and articulation (occlusion). 2. Construction of denture in vulcanite. 3. Construction of dies and counter-dies from impression to completion. 4. Construction of swaged plate, with metal and rubber attachment. 5. Construction of interdental splints. 6. Construction of Richmond crown.

Upon all clinical or practical demonstrations the candidate must attain a general average of eighty-five per cent. The reason for this higher requirement in the practical branches is made evident by the statement that practical men are needed in the service, not theorists. But it may also be stated that practical ability alone would be of little value in military dental practice. The dentist to be successful in this new field of practice must be thoroughly

informed upon all those subjects and theories which form the foundation of modern dental surgery. He will need to be self-reliant and capable of conducting any case that may come under his especial care, no matter how serious it may be, for he will many times be so located that he cannot obtain the advice of a consultant in his specialty; while, upon the other hand, he may be, and that frequently, called in by the post surgeon as a consultant in cases which present oral or dental lesions; or which by reason of certain symptoms the surgeon is led to believe may be dependent upon some obscure dental or oral malady and upon which he desires an expert opinion to assist him in an intelligent treatment of the case.

ASSIGNMENT TO DUTY.

As rapidly as the candidates have passed the examining board they have been assigned to service in the Philippines and Cuba, for the reason that our troops located in tropical climates are in the greatest need of the services of the dentist. When these demands are satisfied in one location the dentist will be assigned to another station, and thus moved about from place to place, wherever his services are most urgently needed. The number of dentists is so few, thirty in all, and the army so large, something over seventy thousand, that there is likely to be an abundance of employment for all those who enter this service. The opportunity, however, for a large and varied scientific and practical experience along professional lines, offered by the establishment of the Army Dental Corps, will be very great, and ought to prove a tempting inducement to the really progressive young man.

REGULATIONS GOVERNING THE DENTAL CORPS.

The following regulations having received the approval of the Honorable the Secretary of War, become, with the General Regulations bearing upon officers of the army, the law governing contract dental surgeons:

Candidates for appointment as dental surgeons must not be less than twenty-four nor more than forty years of age. They must be graduates of standard medical or dental colleges, trained in the several branches of dentistry, of good moral and professional character and prior to appointment will be required to pass a satisfactory professional examination before a board of dental surgeons convened for that purpose by the Secretary of War.

Contracts with dental surgeons will be made for three years, but may

be annulled at any time by the commanding general of a military department, after official investigation, for conduct to the prejudice of good order and military discipline, or by the Surgeon-General when in his opinion a termination of the contract would be in the interests of the service.

Dental surgeons are attached to the medical department and will be assigned to duty in accordance with the recommendations of the Surgeon-General of the army or the chief surgeon of a military department.

A dental surgeon when assigned to a station will apply to the post commander for a suitable operating-room. If no other room is available, the surgeon of the post may assign him a room in the hospital.

Each dental surgeon will ordinarily be allowed one enlisted man as assistant, who will be detailed from the acting hospital stewards or privates of the Hospital Corps, and whose duty it will be to assist the dentist in his operations, in caring for the instruments and other public property, in keeping the records, and in the performance of such other official work pertaining to this position as he may be directed by the proper authority to do. When a member of the Hospital Corps is detailed as dentist's assistant he will receive commutation of rations at the rate of one dollar daily, and will be provided with a suitable room as quarters by the Quartermaster's Department, except while on duty at a post, when he will be attached to the Hospital Corps or other organization for rations and quarters.

Necessary dental instruments and supplies will be purchased by medical supply officers under instructions from the Surgeon-General and in accordance with a supply table to be approved by the Secretary of War.

Dental surgeons will be held strictly responsible for all instruments and supplies issued to them, and will be governed by army regulations and orders now in force, or hereafter to be issued, with reference to accountability for government property.

In accordance with the act of Congress authorizing their employment, dental surgeons will "serve the officers and enlisted men of the regular and volunteer army." The families of officers and civilian employees attached to the army are not entitled to their services. In this connection acting assistant surgeons are to be regarded as commissioned officers.

Dental surgeons will operate between the hours of nine A.M. and four P.M. only upon those officers and enlisted men who are entitled to their services. They may operate upon others not entitled to free services before and after these hours when their services are not required by those entitled to them, but material issued to them by the government will only be used in operations upon officers and enlisted men of the army.

Dental surgeons will not perform any operation upon officers or enlisted men of the army or prescribe medicines for them other than those necessary for the treatment of the teeth and gums. This prohibition does not apply to cases of emergency where no medical officer is within reach, and where a dental surgeon is able to render the necessary surgical assistance to meet the immediate emergency.

Emergency work, whether for officers or enlisted men, should always have precedence. Plate work or restoration of teeth by any method will only be done for those who have lost teeth in the service and in the line

of duty. For plate work or filling teeth only the cheaper materials will be supplied, but gold may be used, if the operating dentist sees fit to use it, at the expense of the individual operated upon.

Enlisted men requiring the services of the dental surgeon will, at the hour prescribed by the commanding officer, be conducted to the designated place under a non-commissioned officer, who will take with him and hand to the dentist a list of those reporting for treatment. This list will be entered in a daybook ruled in columns for surname, given name, rank, company, regiment, etc.; all headings to be the same as those borne on his monthly report.

All cases requiring treatment involving future appointment will be so noted, and the others will be marked according to the circumstances, as "treatment unnecessary," "further treatment unnecessary," "should be sent to the surgeon," etc. When future treatment is necessary the dentist will forward a card as follows:

.....19....

THE ADJUTANT:

SIR,—I have the honor to ask that.....
be directed to report to me from.....M. to.....M. on.....
instant for treatment.

Very respectfully,

.....

Dental Surgeon.

Dental surgeons will submit a monthly report in duplicate (on pre-scribed blanks) of all official work done by them, giving all required data in every case in which professional services have been rendered. This report will be an exact copy of the register kept for the period. One copy will be sent on the last day of the month to the Surgeon-General and one to the chief surgeon of the department in which the dental surgeon is serving.

THE SUPPLY TABLE.

This table is too long to present in this place, but it may be stated that it includes a portable dental chair and a dental engine, packed in separate cases; burs, mandrels, stones, disks, etc.; excavators, chisels, scales, plastic-pluggers, gold-pluggers, rubber-dam clamps, clamp forceps, dam punch, extracting forceps, elevators, steam sterilizer, etc.; in fact, all of the instruments and adjuncts that are really necessary to perform any operation upon the teeth, except for crowns and bridges. Each outfit contains medicines and supplies of filling-material sufficient for three months' service. The smaller instruments and the supplies are packed in two strong cases, arranged with trays and receptacles to hold the instruments and the supplies in place. The whole outfit when cased and crated weighs about four hundred and fifty pounds. To protect the cases

from rain and dampness they are enclosed in canvas covers. The general hospitals, and such other posts as may be designated by the Surgeon-General will be furnished with an additional outfit, consisting of a regular office operating-chair, Allan bracket, cuspidor, instrument-case, extra extracting forceps, and a full laboratory outfit for constructing vulcanite plates, swaged metal plates, interdental splints, crowns, and bridge-work.

NOSOLOGICAL TABLE AND SYSTEM OF KEEPING RECORDS.

The ordinary system of keeping records in civil practice, by means of charts, could not be employed in military practice, for the reason that it would occupy too much space. As a substitute for this the following system has been devised and has received the approval of the Surgeon-General:

DISEASES AND INJURIES OF THE TEETH AND MOUTH.

- Abrasion (mechanical).
- Abscess of the jaws (associated with impacted teeth).
- Calcification of the pulp.
- Caries.
- Cysts of the jaws (associated with devitalized teeth).
- Dento-alveolar abscess.
- Erosion (chemical).
- Fractures of the teeth.
- Hemorrhage (following extraction).
- Hypertrophy of the pulp.
- Hypertrophy of the gums.
- Hypercementosis.
- Necrosis of the teeth.
- Pericementitis, acute.
- Pericementitis, chronic.
- Pulpitis, acute.
- Pulpitis, chronic.
- Pyorrhœa alveolaris.
- Resorption of the alveolar processes.
- Salivary deposits.

NOTE.—The duties of the dental surgeon will ordinarily be confined to the treatment of such cases as are directly associated with the teeth and gums; but occasions may arise when his services would be required as a specialist in the treatment of diseases and injuries of the mouth and jaws, such as cysts of the salivary ducts, empyema of the maxillary sinus, fractures of the jaws, gingivitis, necrosis of the jaws, facial neuralgia, stomatitis, and tumors of the gums and jaws, etc.

CLASSIFICATION OF THE TEETH.

- | | |
|-------------------------------|--------------------------------|
| 1. Superior central incisors. | 9. Inferior central incisors. |
| 2. Superior lateral incisors. | 10. Inferior lateral incisors. |
| 3. Superior cuspids. | 11. Inferior cuspids. |
| 4. Superior first bicuspid. | 12. Inferior first bicuspid. |
| 5. Superior second bicuspid. | 13. Inferior second bicuspid. |
| 6. Superior first molars. | 14. Inferior first molars. |
| 7. Superior second molars. | 15. Inferior second molars. |
| 8. Superior third molars. | 16. Inferior third molars. |

In designating the teeth and in recording all operations upon them, the dental surgeon will indicate the tooth by the following plan, using the letters R. and L. to designate the right and left sides and the figures 1, 2, 3, etc., to designate the tooth. Examples: R. 1, Right superior central incisor; L. 14, Left inferior first molar.

CLASSIFICATION OF CAVITIES.

Simple Cavities on Exposed Surfaces.

Incisors and Cuspids.

- A. Labial.
- B. Lingual.
- C. Morsal.

Bicuspid and Molars.

- D. Morsal.
- E. Buccal.
- F. Lingual.

Simple Approximate Cavities.

Incisors and Cuspids.

- G. Mesial.
- H. Distal.

Bicuspid and Molars.

- I. Mesial.
- J. Distal.

Compound Cavities.

Incisors and Cuspids.

- K. Mesio-labial.
- L. Disto-labial.
- M. Mesio-lingual.
- N. Disto-lingual.
- O. Mesio-morsal.
- P. Disto-morsal.
- Q. Mesio-disto-morsal.

Bicuspid and Molars.

- R. Mesio-morsal.
- S. Disto-morsal.
- T. Morso-buccal.
- U. Morso-lingual.
- V. Mesio-disto-morsal.
- W. Bucco-linguo-morsal.

In recording all operations of filling the teeth, the cavity will be described by the dental surgeon according to the preceding classification, using the letters A, B, C, etc., to designate its location.

Example: A, Simple cavity in labial surface of an incisor or cuspid tooth. I, Simple cavity in mesial surface of a bicuspid or a molar. V, Compound cavity in mesial, distal, and morsal surfaces of a bicuspid or a molar.

CLASSIFICATION OF FILLING MATERIAL.

Tin.
Amalgam.
Oxyphosphate.
Gutta-percha.

The kind of filling-material employed will be indicated by using the first letter of the word designating that material.

Example: R. 5 Q. A. Tooth, right, superior second bicuspid; cavity, mesio-disto-morsal surfaces. Filling-material, amalgam. If a combination filling is employed it will be designated by the first letters of the words designating the materials used. *Example:* L. 7 S. G.-O. Tooth, left superior second molar; cavity, disto-morsal surfaces. Filling-material, gutta-percha and oxyphosphate cement.

Exception: The only filling-materials furnished for the use of the dental surgeon by the Medical Department are those enumerated above. Gold, however, may be provided by the dental surgeon and inserted for those officers and enlisted men who are willing to reimburse him for its cost. The minimum fee to be one dollar, and the maximum two dollars, for such filling.

In recording operations made with gold the full word should be written out.

Other operations upon the teeth will be designated by a combination of letters, as follows:

Abscess lanced—A-L.
Calculus removed—C-R.
Pulp devitalized—P-D.
Pulp extirpated—P-E.
Root-canal filled—R-F.
Tooth extracted—T-E.
Tooth treated—T-T.

One hundred of these sheets are bound in a book, and form the Register of Dental Operations. Each month the dental surgeon is required to send to the Surgeon-General an exact transcript of the Register of the operations performed during that month, upon blank sheets known as the Monthly Record of Dental Operations. These reports are placed on file for future reference. The Register when filled is transmitted to the Surgeon-General and also placed on file.

These records will form an important means of identification in cases of death or desertion, while to the Pension Office they will prove of value in passing upon those applications for pension which are based upon the loss of teeth while in the service of the United States army.

They will also prove of immense value from the scientific standpoint, in efforts to settle the questions of the relative prevalence and spread of dental caries among men who have been selected for military service, because of their perfect physical condition, as compared with men in civil life; of the relative increase in this disease resulting from physical and nervous strain of severe campaigns, and of residence in tropical climates; of the causes and prevalence of pyorrhœa alveolaris, gingivitis, stomatitis, and kindred oral affections.

It will be noticed by the Regulations governing the Army Dental Surgeons and the rules laid down by the Surgeon-General, that the only filling-materials which will be furnished by the government are tin and the plastics; but the dentist is not prohibited from using gold, if the officer or the enlisted man is willing to reimburse him for the material used. (This material he must carry with him at his own risk.) In fact, he is encouraged to use gold by being furnished with instruments and appliances with which to perform this class of operations. He is, furthermore, furnished with an acting hospital steward, whom he is expected to train as an assistant. With such intelligent assistance as this, there is no reason why as good gold fillings may not be inserted by the military dental surgeon as by the dentist in civil practice.

The character of the service which must be rendered in the field will of necessity be that of meeting emergencies. Relief from suffering will be the first object of the treatment, and the introduction of temporary fillings to protect the teeth from further decay until a more favorable opportunity can be secured for inserting a permanent filling.

The dental surgeon will, however, as a rule, be located at posts and stations of a more or less permanent character, where he can conduct his practice with as much care and thoroughness as is possible with the civil dental surgeon.

Each field outfit is provided with a quantity of modelling composition and impression-trays, so that fractures of the maxilla can be treated temporarily, by interdental supports made from the modelling composition, while the patient is being transported to the general hospital, where facilities will be found for constructing any form of interdental splint or other mechanical apparatus that might be indicated.

The army dental surgeon is expected to confine his professional

services to the treatment of the diseases of the teeth and their associated parts, but the regulations provide that in cases of emergency, when no surgeon is present, he may, if competent, render any assistance that the case may demand.

The dental surgeons located at general hospitals and large posts will be furnished with as good and as complete an outfit for a general dental practice as is found in the offices of the best civil practitioners. At such stations the dental surgeons will have opportunities for the treatment of cases in Orthodontia for the children of the officers of the station, or inserting crowns, bridges, and artificial dentures for the officers and enlisted men and for their families; while the general hospitals will furnish a certain number of cases of fractured maxilla, that will need to be treated by the construction and insertion of some one of the various forms of interdental splints.

From the foregoing pages it will be seen that the War Department, through the recommendations of the Surgeon-General, has provided for the care and the treatment of the dental and oral diseases of the army in as thorough and as scientific a manner as is possible under the exigencies of military life and movements. Experience, however, may make it necessary to institute certain changes and modifications in the present system of service, and, when such action is proved to be essential to the welfare of the army and an increased efficiency of the Corps, there is no doubt that the proper authorities will immediately institute such changes and modifications.

Dr. Eugene S. Talbot, Chicago.—It occurred to me after that bill was passed that the profession knew very little about the work to be done by the dentist appointed to fill the position in America's new possessions. It is very gratifying to know that Dr. Marshall has received that appointment. The fact that so few men have been appointed or accepted who have applied augurs well for the standard the board has adopted. They have already stirred up quite a little commotion in dental journals. Editorials have been written and letters have been received showing there is uneasiness. The average dental teacher is of the opinion that all there is of dentistry is simply the filling and extraction of teeth. It is very fortunate for the education of the profession that this law has been passed and a number of dentists sent to the field to attend to soldiers. The work of filling teeth is a very small part of the work

these dentists are called upon to perform. It has been shown, not only in Cuba, but in the Philippines, that many diseases, especially gingivitis, affect the jaws of people who suddenly change climate. It is due to the way the excretory organs are affected by the sudden change of climate; the jaws and the teeth become involved, and in a very short time, sometimes in the course of a few weeks, inflammation sets in, teeth become loose, and in many cases drop out. Such conditions appear in the report that Dr. Marshall has made. The fact that a dentist is expected not only to fill teeth and make plates, but to perform other duties ordinarily within the scope of a physician or surgeon, demands that dentists be properly educated along these lines. The average physician has to be posted in the treatment of those apparently new diseases. A man to treat these cases intelligently must understand general medicine. Just how far a dentist would be allowed the conduct of these cases and give treatment remains to be seen. The conditions shown by Dr. Marshall makes it evident that dental colleges will have to advance their course in pathology, and that a four years' course is now necessary.

INTERNATIONAL DENTAL FEDERATION: FIRST GENERAL MEETING, HELD AT CAMBRIDGE, ENGLAND, 1901.

(Continued from page 796.)

THE President said that after the remarkable speech of Sir Michael Foster he could not hope to say much, because his knowledge of English was very limited. He was almost impelled to close his manuscript and sit down, as there appeared to be nothing more to say. He had come to the town of Cambridge and to its university not only to place himself under the instruction of great philosophers, but to feel the influence of the education which had been going on there for centuries. Sir Michael Foster had spoken and advised on a question which divides the dentists throughout the whole world, and Sir Michael had said what was to be said better than any one else had ever said it before. But, as he had prepared a speech, he supposed that he must say something, and he claimed their indulgence.

The President then delivered the following

INAUGURAL ADDRESS.

MR. CHAIRMAN AND GENTLEMEN,—Last year, the twelve hundred dentists who attended the Third International Dental Congress, which was held at the time of the Paris Exposition, decided to preserve the professional organization created in view of that Congress by organizing the International Dental Federation, with its Executive Council and an International Commission of Education. The dentists wanted to form a universal union of the nature of that formed several months afterwards in the case of the *sociétés savantes* while waiting for the time when diplomats and governments should realize this union in all the branches of human activity, making the latter a compact entity. According to this decision, a meeting was held in Paris immediately after the Congress.

This year we have come to England to hold our second meeting. The welcome that has been tendered us, the prominent men that have taken part in our discussions, and the first results of our work show that the organization newly created by the Paris Congress supplies a necessity of our epoch, and that it will produce useful results for the advancement of the science of odontology. I have maintained that the meetings of the International Dental Federation attract the choice men of our profession. And indeed they are choice men,—those who do not hesitate to leave their families, their occupations, and their countries to discuss topics not of direct or immediate interest to them, but that constitute the problem of the education of their successors. Our *confrères* will certainly ratify the statements just made when they see the list of practitioners that have attended our meetings, representing sixteen of the most important countries of Europe and America.

As far as our labors are concerned up to the present, they have consisted mainly of an exchange of ideas in view of organizing and devising a plan of work for our future meetings. The more complex and important a body is, the longer must be its period of organization.

The birth of the new element of professional progress took place last year in the midst of great ceremonies, and in the presence of the most authoritative representatives of the dental profession of the world, in a meeting presided over by one of the greatest *savants* of the University of Paris, Professor Gariel, the delegate of the government. It has been the desire of the Execu-

tive Council that the second meeting, which constitutes for our International Federation a sort of scientific baptism, should take place with the same ceremonials, and for this purpose it has requested the eminent vice-chancellor of the University of Cambridge to stand as its godfather.

The Executive Council has honored me with the delicate mission of indicating the purpose that we are working for. Pardon me, gentlemen, if I confess to a feeling of timidity in having to address so distinguished an audience, in view of the knowledge and talent properly required for such a task. I shall, however, endeavor to fill any lack in those two factors by contributing all the good-will of which I am capable.

Our work is one in which we have to deal constantly with difficult problems. In the first place we have the diversity of languages; this, however, is an obstacle easily overcome. There is another one of greater magnitude, brought about by the character of the different countries in which we live, by the difference in the legal conditions of their organization, and especially in their degree of evolution,—evolution which is in some slight degree the cause of our diversity of opinions. We must make great efforts and many mutual concessions in order to harmonize our national conceptions into the international plan which it is our wish should emanate from our discussions. A certain amount of work is also necessary, in order to set forth this programme in such a way as to be understood and accepted by every one of us.

It seems to me that it is a daring act for me, the modest representative of a science as yet new, to stand here in this old university, before such distinguished professors, and talk to you on education,—that is, on one of the highest problems, even though it be limited to the training of young dental surgeons. Therefore I have aimed to shelter my affirmations under the authority of men whose names and writings are highly valued in this connection. Two thoughts that I have borrowed from Michelet have encouraged me. One is that education is the first, the second, and the third part of politics,—that is, its pure essence; and the other is that in an advanced society teaching ought to be the function of almost every one.

While working at the preparation of this paper, my mind was impressed with the importance—for the future of humanity—of an Anglo-French combination. And so I consulted alternately

the French and English philosophers. I went from Michelet to Herbert Spencer to Stuart Mill, and from Roger Bacon to Descartes, in order to borrow from them the general principles which must guide us in the preparation of a national programme of instruction in the midst of the contradictory ideas which are contending for the direction of public education. It has been through the inspiration of their principles that we are able to know the value of every science which is to be part of this programme, and adopt a method of appreciation of their worth; and also in order to know the means of differentiating between studies having an intrinsic value and those having a merely conventional one, and between those that are valuable from the view-point of knowledge and those that are important from the stand-point of education and discipline.

We shall then understand better the difficulties of education in general, with the harm that can be done to the mind by the studies that may enter into the formation of a programme or by the faulty order in which they are taught; also the necessity of proceeding from the concrete to the abstract rather than from the abstract to the concrete. It will be easier to understand the necessity of comparing these general principles of education with those that inspired the curricula of our schools, prepared empirically and according to the needs of the respective countries.

Among the general notions capable of directing us in our work, and that can be transformed into accurate proportions applicable to the teachings with which we are concerned, I will quote the following paragraph from the admirable work on Education by Herbert Spencer: "One of the conclusions at which we arrive is that in every branch of knowledge we must proceed from the empirical to the rational. A leading fact in human progress is that every science is evolved out of its corresponding art. It results from the necessity we are under, both individually and as a race, of reaching the abstract by way of the concrete; that there must be practice and accruing experience, with its empirical generalizations, before there can be science. Science is organized knowledge, and before knowledge can be organized some of it must first be possessed. Every study, therefore, should have a purely experimental introduction, and only after an ample fund of observations has been accumulated should reasoning begin."

It is curious to observe that this proposition of the English

philosopher can be easily applied to the organization of dental education, such as has been very well understood by the different nations, especially by the United States, England, and France. In fact, in the English schools the apprenticeship of dental prosthesis precedes the special scientific and medical studies, which, in the evolution of the profession, is according to the historical evolution indicated by Herbert Spencer, and according to the principle of the subordination of the abstract to the concrete. We will endeavor to inspire ourselves with the principles of those great thinkers who have studied education in general, that we may apply them to our particular branch of education, whose purpose is to form good odontologists.

It is not an indifferent question, for the state and for the people at large, that odontologists should receive a rational education in proportion with the progress of their special science,—an education capable of developing their qualities to their maximum.

It is not necessary that I should say anything to you upon the utility of the dental system for the preservation of health. At an epoch not very remote from this good teeth were an indispensable requirement of the soldier, who, however, had to open cartridges with his teeth. Progress in the military art has caused the disappearance of this practice. The state should by no means, just for this reason, be indifferent concerning the organs under our supervision. The teeth are always necessary for the development of the child, as well as for the conservation of health in the adult. Dentistry should hence be in evidence in the school, in the army, and in all aggregations of human beings as an important part of hygiene.

Likewise, it seems unnecessary that I should call the attention of dentists to the importance, for their dignity and for the position that they should occupy in the state and in the public estimation, that they should receive a complete and rational education, which would permit them to render to their fellow-citizens all the services within their province. A good education for the dentist is for the state a question of public interest, as it is for the dentists themselves a question of professional advantage. This for a long time has been perfectly well comprehended by our *confrères*, as can be seen by the papers on these questions that were read at our last professional meetings.

From the foregoing, it can be seen that the international union that we are endeavoring to bring about is useful and desirable, but

the obstacles to which I have already referred, obstacles with regard to the laws, customs, traditions, the routine, the prejudices of every country, are numerous. There are others inherent to the conditions of evolution of odontological science, and to which I shall refer only in brief. Odontological science, from the view-point of special science, is relatively a new one, at least it has been recognized as such only in recent times. Recent historical works show that in all refined communities, in Egypt, in Greece, in Rome, the dentist existed in remote times as a special practitioner.

At the beginning, when medicine was closely connected with the priesthood, the priest, and later on the physician, were able to treat the disorders of the teeth as well as those of the other organs of the body, but soon a different kind of treatment became necessary,—the prosthetic or restorative one, involving a mechanical art with which the physician was not familiarized and to which he was not sympathetic, according to the expression used by Dr. Kirk. It is this prosthetic art that gave birth to the prosthetic dentist.

The evolution of odontological science has taken place not without a certain amount of antagonism between these two kinds of practitioners; the physician, on the one hand, occupying himself with the purely medical phase of the diseases of the mouth, and the specialist of dentistry of the prosthetic phase, being a simple artisan at first, becoming later on the surgeon-dentist, having added gradually to his technical training in order to reach that step,—the study of the medical branches directly applicable to the needs of his *clientèle*.

As Dr. Kirk has very wisely said, it is he who can be looked upon as the departing-point in professional dental evolution in all countries. It is by him and for him that this evolution has taken place. It is for him that in 1700 special laws were framed in France; it is for him that later on, in 1726, Fauchard, the father of modern dentistry, wrote the first special and complete work on dentistry. It is for him that in 1838, in Baltimore, Harris and his friends founded the first dental school, separately from the schools of medicine, after an interesting declaration of independence, which can be considered with Fauchard's book as the *acte de naissance* and the scientific basis of odontological autonomy.

A certain number of dentists, holders of the medical degree, considering that medicine and dentistry should be indissolubly ligated, did not adapt themselves to the plan that dentistry should

be taught and practised as a specialty of medicine. And, as Dr. Kirk says, this opinion persists in spite of the success obtained by the dental schools in all the countries of the world, and also notwithstanding the fact that the separation between medicine and dentistry is becoming more accentuated from the stand-points of both education and practice. Some countries of Europe have followed this doctrine, and have arranged accordingly education and practice.

It is understood that, according to whether one or the other principle is accepted, the solution differs as far as education is concerned. In fact, if odontology is considered as a simple medical specialty, as ophthalmology, laryngology, and gynæcology, it suffices that the student should first conclude his medical education in a medical school, and then, if he thought it necessary, he would go for a few months to a dental school in order to familiarize himself with the technique of dentistry that he did not learn in the hospitals. In the second case the student enters from the beginning the dental school, where he completes his entire education, just as the student in pharmacy studies his profession in a school of pharmacy, with the addition, if necessary, of a few special courses at the school of medicine or at the hospital.

In order to cause the disappearance of the antagonism of these conceptions, and to dissipate the difficulties that they oppose to the progress of our teaching, it is necessary, according to Herbert Spencer, to bring to light the facts which have been accumulated in sixty years of teaching in the countries where dental education has been organized in an empirical manner,—that is, according to the needs and necessities of the time. For this purpose we have to make appeal to impartial statistics. This is the first part of the work of the International Commission of Education. This introductory work is important from the stand-point of the direction in which dental education should go, and also from that of the position that this teaching should occupy in the universities. But this question is not the only one that requires our attention; there are others, of secondary importance, it is true, but nevertheless questions which the representatives of both doctrines could discuss to advantage and agree upon. Among these we should include the problem of the necessary preliminary education for the dentist.

On this question we also see the reappearance of rivalries of the classical and scientific education with regard to the utility of the

mechanical and preliminary professional education, such as is given in the United States in the manual training-schools, in France in the École Diderot, as adopted by the Paris Congress, and such as we see it in London in the Institute of Technology as organized by our friend Cunningham. We will also mention the question of the extent of the scientific programmes, medical or technical, theoretical or practical.

In order to determine exactly the studies which should enter into the programme, we must first of all determine the duration of these studies. It is evident that when the time shall come for the discussion of the quantity of medical sciences and of mechanical art that should compose the programme of the future dental surgeon we will again find the partisans of the two opposite principles. But then one factor interposes itself like an arbitrator; I mean the duration of the course,—the number of hours that could be reasonably consecrated to dentistry. “Had we time,” says Herbert Spencer, “to master all subjects, we need not be particular.” To quote the old song:

“Could a man be secure
That his days would endure,
As of old, for a thousand long years,
What things might he know!
What deeds might he do!
And all without hurry or care.”

But “we that have but span-long lives” must ever bear in mind our limited time for acquisition. It is superfluous to declare that we must limit ourselves to the useful, to the essential, to the indispensable. “It is not necessary,” says Descartes, “that the honest man should have read all books, neither is it necessary that he should have learned everything that is taught in the schools. Moreover, it would mean a mistake in his education if he had consecrated too much time to the study of letters; there are many other things to be done in life.” Hence the time that it is possible to devote to study will be co-arbitrator with another factor,—the number and nature of the operations which the dentist is called upon to perform at the present time in the branches of operative and prosthetic dentistry and anæsthesia.

Lastly, the results obtained in the different educational centres, with the different systems in vogue in America, England, France, Switzerland, Austria, Germany, and Russia, will also enter in this account. This is why the active collaboration of the men of all

countries is necessary. Then we will see that by placing ourselves on an international stand-point all our discussions will lose some of their acerbity and intensity, and we will get rid of the irritating questions which often refer to minor considerations—mere words or purely local designations—rather than to real division.

By elevating the discussion to a philosophical standard, we shall agree that odontology is a science which tends to the preservation of man; it is a biological science. Hence it is perfectly possible to conceive, according to Professor Eliot, president of Harvard University, recently quoted by Dr. Kirk, a new university where the teaching of biological sciences would be established on a broad basis, so that all students, according to the purpose of their studies in relation to the profession chosen,—so that practitioners or savants, physicians or dentists, should be able to take up the fundamental knowledge which they would require while following the study of a specialty not taking up more than about four years, and to conclude by obtaining the final diploma of doctor in this specialty.

Under such conditions dentistry, says Dr. Kirk, would have a place in medical education or, better, in the university in proportion to the needs of its practice, and the antagonism to which we have referred would not exist.

But, no matter what the future reserved to this proposition is, in the mean time the discussions of the International Commission of Education will contribute to advance in our several countries the question of the position of the dental surgeon and of his education. We want to work for the benefit of our successors, and prepare the best programme of intellectual, moral, and physical education. Besides, in this work there is a thought capable of giving us much satisfaction,—the thought of love of humanity; and love, according to Auguste Comte, is the secret of human nature, the secret of the world.

We have applied to this work the principles of thinkers and of philosophers of whom humanity feels honored. By the welcome that has been tendered us we are assured of the support of the savants of this university. This is our encouragement, and also our reward.

This work is new; it will have to be developed by others, and, as stated by that great man who went through this university,—Roger Bacon,—“Many will pass and science will grow.”

Sir Michael Foster.—I am sure we have all listened with very

great pleasure to the admirable address of our president, and did that great trouble, time, allow we might proceed to discuss some of the points that he has raised. But it is my duty—not only as deputy vice-chancellor, but as professor of physiology—to remind you that in a very short time you will be called upon to perform, according to your programme, certain physiological operations in which the teeth play an important part. I think we shall be consulting our interests if we defer further discussion until this afternoon, and now gently wend our way to the Combination-Room of Trinity College, where the vice-chancellor has provided for you something to eat.

LUNCHEON.

At the invitation of the vice-chancellor of the university, and with the kind consent of the Fellows of Trinity College, the delegates were entertained at luncheon in the Fellows' Combination-Room, Trinity College. Sir Michael Foster again presided, and, with the Regius Professor of Medicine and Dr. Cunningham as "croupiers," at the conclusion of the luncheon said:

The autocrat of all the dentists, Cunningham, has issued a decree that there shall be no speeches at this luncheon. I understand you are going to have as many as you want this evening at the banquet, but we are to have none here. Still, I think you would like me to convey on your behalf some words to the person who is the real vice-chancellor of this university. I am only for the time being the deputy vice-chancellor; the real vice-chancellor, I hope, is fishing in Scotland, recruiting his health, which has been impaired by his many labors during the session. But I may say that I will convey to him on the part of you all your best thanks for the opportunity you have had in meeting in this old university, and also—may I add?—for the excellent repast, which I am sure he ordered in fear and trembling, knowing how severe critics you dentists were in everything that concerns the mouth.

At the instance of Dr. Godon, the healths of the vice-chancellor and of Sir Michael Foster were drunk with acclamation, Dr. Godon remarking that the Federation had never been, and never would be, better treated than it had been that day.

CONFERENCE.

In the afternoon a conference was held in the Trinity College Hall, over which Sir Michael Foster presided.

The following address on "Dental Education" was read by Dr. Joseph Griffiths (University Reader in Surgery) :

SIR MICHAEL FOSTER AND GENTLEMEN,—I feel this is an occasion for introducing what I am about to say with apologies, because neither am I a dentist nor indeed do I know, except in very general terms, anything of the education of a dentist. But, as I have been asked to speak upon the subject now under consideration, I beg you will grant me that indulgence which you, tried by meetings and speeches during the last week, must be pretty well accustomed to exercise, and which I trust you will freely bestow upon me and the matter of my remarks. As, however, I represent the sister art of Surgery in this university, and am engaged in the teaching of the art, as well as the science upon which the art is built up, I may be allowed to have a small say in the matter of the education of the dentist. This subject is not new to me, thanks to Dr. Cunningham, who has on many occasions brought it before me for discussion on the main principles which should guide in the bringing up of the dentist. As I have said above, I know nothing of the work of the dentist except in a general sort of way, which I gather on the occasions when I seek his advice and aid, and all I can hope to bring to the discussion of this interesting subject is the *point of view* of the surgeon, who is in one sense the father of the dentist, he being even now capable by law of undertaking, if he chooses, the practice of dentistry.

Now, I believe I am correct in making the following statement,—that the dentists are divided among themselves as to the best means to adopt whereby they themselves can be best educated; and, broadly speaking, they are divided into two sections. To both sections, however, the desire to produce the best dentist is common, and each section naturally thinks it has found the right way. So far as I am able to gather and understand, this difference between the two sections may be expressed in the following manner: One section desires that every dentist shall be trained as a medical man is, and then take up dentistry; whereas the other section desires that a dentist shall be trained to his own profession from first to last. (Before we proceed any farther, I think it would be well for me to state that all I am about to say applies to the average, and not to the exceptional, dentist.) To emphasize this proposition, let us put it thus: One section desires dentists to be qualified medical men who have, as it were, taken up dentistry as an after-thought,

and the other wishes for a dentist from start to finish. According to the former, the man would be given a general medical education, and it can be estimated at nothing more, to base his future practice of dentistry upon; whereas, according to the latter, he would be given an education upon which his future work directly depends.

Is the education of a dentist to be that of a medical man with dentistry added on, or is it to be designed to meet his own requirements? is the question of the hour.

To help in the solution of this interesting problem, a brief comparison between the training of the medical man and of the dentist may not be out of place. In the case of a medical man the first half of his educational career is spent in gaining a complete knowledge of the normal man, and he takes biology, chemistry, and physics as introductory subjects to anatomy and physiology. This is done in order to give him a better understanding of the structure of the body in detail and of the functions of its several organs and tissues. The second half is spent in acquiring all that is known of morbid changes and abnormal functions, and in a training in the physical examination of any and every part of the human frame. In the earlier half, then, he is trained in methods adopted in the different subjects for eliciting knowledge, and in the second he is directed to employ the methods with which he is already familiar to determine as far as possible the physical condition of any or every part of the body.

On the other hand, in the case of the dentist the first period is spent in acquiring the knowledge of the nature and of the mechanical properties of certain materials and in the training to perform accurate work, which must be done, so I understand, to a nicety,—a training similar to that of a mechanician. In the second period he is directed to acquire a general knowledge of the structure of the body and of the functions of its several parts; a minute acquaintance with the teeth and the jaws, and of the diseases they are liable to; with the application of the methods, already familiar to him, of dealing with the teeth in their morbid states.

Such I believe to be a fair general statement regarding the training at the present time of a medical man and of a dentist. Let us contrast the requirements of these two. The medical man requires a knowledge of the minute structure and of the functions of the whole body, but the dentist only a knowledge of the minute structure of the teeth and of the jaws, and a general idea of the rest of the

human frame. A medical man requires only a general, but sound, idea of mechanical work, but the dentist a thorough knowledge of it, so that he may be able to perform his work with accuracy. A medical man requires a detailed knowledge of all diseased processes and their known causes, but the dentist a particular knowledge of morbid processes as seen in the teeth and jaws, and only a general idea of the morbid processes observed in the remainder of the body. Such a review brings out pretty clearly that the educational career of a medical man does not coincide with that of the dentist except in a few particulars.

Even in anatomy and physiology, in which their work comes nearest together, the dental student requires that which will give him a sound understanding of the teeth and their connection with, and relation to, the remainder of the body, whereas the medical student should be familiar with the whole body. Of course, the more a dentist knows of the human body or of any other kindred subject the better he will be equipped generally, but not necessarily better furnished for the work of his own profession.

And if we go farther and compare the surgeon with the dentist, we shall find that their work differs in a material degree. The dentist must possess many of the qualities that go to make a surgeon; he should have a quick perception, a keen insight, a sensitive touch, and be ever ready to act. But the skill of the dentist is largely, if not entirely, the result of that training in the mechanical department, so to speak, whereas the skill of the surgeon depends less upon mechanical training than upon accurate judgment to do enough and no more,—for in hardly any operation is it necessary for him to make a physicist's measurements and to adhere to them. Mechanical training has indeed been neglected in the education of a surgeon, and hence it is that we often deplore the mechanical knowledge and the reasoning built upon its deficiency as displayed even by surgeons of repute. This has been neglected, I imagine, because that skill born of judgment has been estimated so highly. Now, with the dentist it is just the reverse, for who can conceive a dentist who is ignorant of mechanical work?—but one without judgment may perhaps be occasionally met with. Thus the surgeon is at one end of the scale and the dentist is at the other, and doubtless it would be a good thing to improve them both, but in contrary directions.

Enough has, I hope, been said to point out that to make a dentist his training should be so arranged as to bring out his fitness for the

work before him. A mechanical training of the best kind is essential to him, and must form the basis of his future work. In addition he requires a knowledge of the minute structure and of the function of the teeth, the material upon which he will have to bring his best mechanical skill to bear. I would therefore strongly urge you not to imitate the education of a medical student, but to continue on the lines which will train a dentist for his own profession from first to last, and to have a single purpose in view and to endeavor to obtain a definite result. Do not try to make a medical man a dentist, but let a dentist start and finish as such.

Can this education of a dentist be carried on side by side with that of the medical man? is the question of practical importance. I would unhesitatingly answer, No. The anatomist may train either, but he cannot train both together without giving one much more than he requires and not paying enough attention to the other. It is much the same with physiology. Therefore I say their courses should be separate, and so arranged as to serve the right end. In physics and chemistry the same training might serve; in study of diseases, No.

Is such a course of study proper for a university to undertake? In my humble opinion it is and should be, for the work of the dentist is as honorable and as worthy of respect as that of any of the older professions, and I trust that the newer universities will take this line and have an avenue for dental students to obtain a university degree side by side with the medical student. But I also trust the authorities will let dentistry and medicine be free to develop along those lines which each finds best suited for its own progress.

Although dentistry was once an intimate part of the medical art, it can hardly be so again, for its evolution has been so complete that it now forms a distinct and separate division of the art of healing. It is, I venture to think, a child of the old stock destined to continue an independent existence and to work out its own salvation.

At the conclusion of the address, and before the opening of the discussion, Mr. W. B. Patterson, the honorary secretary of the British Dental Association, entered the room, and was heartily welcomed by Sir Michael Foster.

Dr. Brophy (Chicago) said that years ago he held views quite contrary to those he held to-day, but in the light of advancing education and the development of dentistry he had been forced to accept ideas that were formerly not agreeable to him. In the United

States dentistry had its birth as a separate and distinct school of training; it was not from choice, but because the medical profession refused to give dentistry a place in their curriculum. At that time it was regretted, because it was wished that dentistry should be a part of the parent medical profession. But, independent schools having been founded, such branches of medicine were taught as the founders felt were necessary. The schools had now added, from time to time, departments until one who was not acquainted with all the medical curriculum might readily be led to believe that they were schools of medicine. It was recognized that in Europe the conditions were quite different from those in America. It was felt that it was quite impossible to make changes in this country, and in many instances it was quite impossible to make changes in America. The question, therefore, was how to prepare a man to do his work. He had the pleasure of sitting by the side of Sir Michael Foster at luncheon, and he put to him the question. He had a boy nineteen years of age, just ready to enter the university; should he be prepared by a long four years' course in the university and then entered at the school of medicine for another four years' course or not? The answer was, "I would prepare him for his life's work. A student of medicine should devote his attention to the study of physics and chemistry and languages." Had he learned nothing more in his trip to Europe, he would have been fully compensated by that answer. He quite agreed with every word contained in the paper. The man who started out in life to prepare himself for any particular calling must have in mind that calling from the beginning to the end.

Dr. Sims Woodhead (Professor of Pathology, Cambridge) said that every man preparing for his life's work underwent a certain amount of general training, a training to fit him for the specific work he had to undertake later; and he could not help thinking that perhaps the preliminary years of the dental student and medical student might at any rate run on certain parallel lines. An attempt was made, how far successfully it was difficult to say, in the subject he had to deal with to give the medical student, as soon as he came from his study of anatomy and physiology, some inkling of the general processes of disease. The student specialized in the direction of special pathology, diseases of the nervous system, diseases of the kidney, and so on; but before he took this up it was absolutely necessary he should have a good solid foundation of the

general processes of disease. That being the case, he could not help thinking it might be somewhat dangerous to begin to specialize at too early a stage, and whether it would not be better to study at any rate the general physiological and pathological processes, in order that in studying the disease of the special parts to which attention was to be devoted one might go to the very foundation straight away. From that point of view he put in a plea for some common ground in the earlier part of the dentist's professional life. He recognized how much dental surgeons had contributed to the subject of bacteriology. In fact, the earliest experiments in bacteriology were carried out on material taken from the teeth. He quite agreed with dentists specializing in the later stages of their course and not attempting to be medical men or surgeons, because they wished to treat a patient for special diseases of special organs, and it was their duty to know far more about those than any medical man or surgeon possibly could know. Dentists were experts, and therefore required an expert training. Even the surgeon found it necessary to specialize, and anything outside his own work he handed over to a colleague. In that light he hoped no attempt would be made to make the dental qualification a medical qualification, but that it would be made something far better for the purpose than any medical or surgical qualification. The dental surgeon was a man specializing in a certain direction, who had built up his profession on a good sound* foundation of general physiological and pathological knowledge.

Professor Hessé (Leipzig) considered that the preparation for the dental profession was so different in different countries that it was almost impossible to fix a rule or a standard for the preparation in all countries. It was necessary to be guided by the point in view,—namely, the development of the art or profession which it was intended to practise, and the training should be such as was best fitted to secure that end.

Dr. Aguilar (Madrid) said he was deeply interested in the proceedings of the Federation, because he was the first to feel the necessity of such deliberations. It was only a few months ago that in Spain the law for establishing a dental department in the University of Madrid was passed. Prior to that there was no dental teaching except what was given privately. He had the honor of being appointed to the Chair of Dentology in the University of Madrid, and when he was called upon to propose the curriculum

of studies he felt the necessity of learning the opinion of learned men,—and that opinion could not be better gained than through the Federation now assembled in Cambridge. He felt himself fully compensated and over-compensated for the trouble of attending the meeting. He had no authority to express an opinion of his own, and he would only place in the hands of the chairman the following proposition:

“That five members be appointed to propose resolutions on the following questions and report at the next meeting:

“(1) What preliminary studies should be required for the admittance of students into the dental colleges?

“(2) What are the technical, theoretical, and manual studies the student should pass through before being allowed to practise dentistry?

“(3) What part of the studies taught in the medical colleges should be followed by dental students?

“(4) What are the most reasonable titles to be applied to the persons who practise the therapeutic and prosthetic treatment of the diseases of the teeth and mouth?”

On the motion of Dr. George Cunningham, seconded by Dr. Brophy, the resolutions were referred to the Committee of Education, with full power to act.

Dr. Kirk.—It was said some years ago by a gentleman who resides not so many miles from this spot that the “evil that men do lives after them; the good is oft interred with their bones.” But in what has taken place at this conference it seems to me we have at least one instance where the reverse of that proposition is true. If I have been able to correctly interpret the *motif* of the eloquent and scholarly address by Sir Michael Foster, to which we all listened with such deep interest, I feel that I do him no injustice when I recognize in it the practical application of the principles set forth by Mr. Herbert Spencer in his epoch-making essay on Education, or when I further recognize in it the spirit which animated the life-work of that man who, more than all others, I regard as the Nestor of dental education in England, Sir John Tomes.

I was told before I left America, and even since my arrival in England, that it would be quite useless to expect that anything which might be done as a result of the conferences of the Federation would have any effect in modifying existing views on the sub-

ject of dental education in Great Britain; and yet here in England there has been given out by one of her recognized educational authorities, and from one of her greatest universities, a statement of the principles of dental professional education the most liberal, logical, and reasonable which, in my judgment, has yet been uttered anywhere.

Like Mr. Spencer, Sir Michael Foster in his address recognizes the utilitarian character of professional knowledge, and the inevitable conclusion therefrom, that education should, from the beginning, be adapted to the uses which the knowledge thereby attained is intended to subserve. He has, by keeping that central idea in view, cut the Gordian knot which for years has confused our discussions and thought on the relationship of dentistry to medicine. His statement that the dentist, within the limits of his activities, is a "healer" places the dental practitioner upon the basis of a natural classification much more readily understandable than when he is regarded, either positively or negatively, as a medical specialist, for, lacking as we do an adequate definition of medicine, it is not yet possible to decide whether a dentist is a medical specialist or not.

The enthusiasm and unanimity of appreciation with which the address of Sir Michael Foster has been received clearly indicate the general acceptance which this representative international gathering has accorded to the views he has expressed. So evidently is that the case that it seems to me the further deliberations of this body may be most profitably confined to a study of the dental curriculum, or, in other words, to securing an arrangement of professional study in conformity with the principles set forth in the address, best suited to the education of the dentist. The best attainable curriculum is yet to be devised; the very fact that such marked differences are to be found in the curricula of dental colleges throughout the world is self-evident proof of the need for further investigation of the best methods for making dentists. It would simplify the question greatly if we should arrange all of the subjects now taught in all dental colleges into two categories: First, those which are essential, and, second, those which, though not essential, are desirable in the education of the dentist. We would then be in position, after having formulated a minimum essential curriculum, to provide for its continued expansion and improvement by the gradual inclusion of members of the category of desirables into that of the essentials.

Reference has been made to the importance of manual training as a feature of the dental curriculum, in order that there may be given to the student that high degree of manipulative dexterity without which he is unable to achieve success as a dental operator. We all admit the importance of manual training in dental education, but not all dental educators have clearly recognized an equally important consideration in that connection,—namely, the stage of development at which manual training should be undertaken by the student. I am not a physiologist, and I am glad to be in position to submit to the judgment of the distinguished physiologist, as well as educator, who is our presiding officer to-day whether it is not true that, in order to successfully train the hand to a high degree of dexterity, the manual education must be undertaken early in life; for a period quickly arrives in later years where such training becomes impossible. It was that fact which was clearly recognized by Sir John Tomes, and which he so energetically and practically advocated in his efforts at dental educational reform in this country.

We have frequent and familiar examples of an analogous state of affairs in connection with the use of the bicycle. It is quite possible for an individual after attaining adult years to learn to ride the wheel, but the later it is put off the more certainly does the unfortunate rider develop that anxious expression of countenance which in America we call the "bicycle face." The learner may in time know how to propel his machine, but in so doing he acquires infinitely more knowledge about every feature of the topography of the road-bed over which he travels, and never acquires that freedom and abandon begotten of the automatic muscular co-ordination with which the street urchin of a dozen years controls his machine. It is the necessity for manual training for the dental student in an early period of his career, when his muscular and nervous receptivity are at their maximum, that we find, in my judgment, the strongest argument in favor of a special curriculum for the dental student, and a sufficient reason why his special education should not be deferred until after he has pursued a standard course of medical training.

Professor Griffiths has referred to the importance of including the study of bacteriology in the dental curriculum. I know of no better illustration of the practical utility of a knowledge of bacteriology to the operative dentist than that embodied in the statement

recently made by Dr. Black, of Chicago, in which he said, with reference to the preparation of cavities in teeth preparatory to inserting fillings, that "the margins of all cavities should be laid down upon areas of tooth-structure which are relatively immune to the attacks of the bacteria which cause dental caries, in order to prevent a recurrence of the disease."

If that axiom be true, and I think that no one can successfully question its accuracy, the evident conclusion must be that no man can intelligently and successfully prepare a carious cavity in a tooth for filling except he be fortified by a fair knowledge of bacteriology. I feel that we may congratulate ourselves as dental teachers and practitioners upon our good fortune in securing the encouraging and far-sighted statement of dental educational principles embodied in the able address of our distinguished chairman and of those who have followed him.

Sir Michael Foster said, in answer to Dr. Kirk's inquiry, that for many years past he had urged that the education of the surgeon should not be delayed too long, because it was impossible after certain years to acquire that suppleness and dexterity of touch which were necessary for success. The mind grew old very slowly, and could be educated even late in life; but the body became old very soon, and it was necessary to train it while it was really young.

Dr. Rosenthal (Brussels) said that the evident conclusion of this conference was that nearly every one was of the same opinion, and he thought that *Sir Michael Foster* had said that morning nearly all that could be said on the matter. He proposed that *Sir Michael's* speech should be translated into all languages and sent to all the bodies in the world interested in the matter. In Belgium there was a movement towards putting dental education into the hands of the medical man, but the basis upon which such a resolution was taken was a monetary basis. The medical profession was so overcrowded that they thought specialization in dentistry would prove remunerative and relieve the overcrowding of their profession.

Sir James Crichton Browne was glad to have the opportunity of paying his tribute of admiration to the excellent address delivered that morning,—an address instinct with wit and wisdom, adorned by epigrams and similes which would not be easily forgotten. *Sir Michael Foster* referred to the early training of the dentist at the bench, and the subject had been further emphasized by the

excellent observations of Dr. Kirk. Speaking from his own point of view, he attached great value and importance to the manual education of the dentist, and was inclined to attribute to that education a utility and significance that are not perhaps always generally recognized. Every surgeon knew that the movements of the hand were initiated in a certain group of centres of the middle region of the brain,—motor centres of the brain. But they were motor centres only in a special sense. They were not motor simply in the sense of sending forth impulses in response to excitations from without; they were motor in the sense of being the springs of movement, and they were receptacles in which was chronicled all the knowledge which the muscular operations put the man in possession of. The muscles not only obeyed the commands of the will, but they added infinitely to the information and intellectual acquisitions. The most cursory analysis of ideas revealed the fact that there were very few of them which were known purely by sensory impressions. The motor centres of the brain took an enormous share in mental life, and mental manifestations would be as impossible without them as would be the circulation of the blood without one ventricle of the heart. The highest possible functional activity of the motor centres was as important with a view to mental power as to muscular expertness, and the motor centres for the hand were very prominent among the motor centres of the brain. They were related to an organ which in its enormous combination of movements largely added to our intellectual resources, and it was evident that the highest possible functions of activity of those centres was of value in adding to intellectual grasp as well as adding to the expertness of the hand and to business success. But in order to have the highest possible functional activity of those centres it was necessary to have them trained betimes, and therefore it was necessary to give the student his manual training in dexterity very early in life; and by doing that one was not merely training the hand, but was helping to expand and develop the intellect.

Dr. George Cunningham thought the members would appreciate the results of the first general assembly in connection with the Federation, and he thought the discussion on education was a record which would be hard to beat. The Council had been authorized to appoint a Committee on Education, and he proposed, as a tribute to the success that had been met with that day, that the members should do something to promote the practical education

of the public in dentistry. He proposed the appointment of a Committee on State Dental Service. It had been said at a meeting of the representative Board of the British Dental Association by a veteran whom he admired and respected for his past work, that he did not know what state dentistry was, and that he hated the word. State dentistry meant the utilization of the dentist's services by the state. The question of dentistry in the army never was settled. A war in Cuba was necessary to produce what was recommended before the war,—dentists for the army of the United States. Before the Boer war began there were dentists who as patriots thought their best place and their greatest assistance was in utilizing their services for the state, but their services were rejected. Four dentists had been sent out to the front to look after nearly a quarter of a million men,—very capable dentists, but without much experience. What were those few among so many? Their services would be lost, and the danger would occur that instead of giving the men the benefits of conservative dentistry there would be a greater utilization of the forceps, which to some had ceased to be a dental instrument at all. He would not be content with the dental services accorded to the army at the present moment by the War Department as long as the dentists were made servitors,—unless there was a superior mind of a dental character to guide the work. He therefore proposed the formation of a committee to take up the subject.

The proposition was seconded by Dr. Godon.

Dr. J. Leon Williams thought the greatest work which the Federation could do was not so much to educate the dentists as to educate the public. He therefore asked the Federation to keep in view two things,—first, the harmonizing of dental teaching, which meant to keep in very close touch with the most advanced scientific investigation. There must be always a divergence of opinion of all arts,—that was one of the conditions of progress,—but he felt there might be much more harmony in the application of scientific principles. A patient might go to one dentist who recommended a certain method of procedure, but if that patient went to another country, or to some one else for the same thing, a totally different course was recommended. In the advanced stage of scientific dentistry that was not necessary, and therefore he thought a part of the work of the Federation should be keeping in the closest possible touch with the great scientific questions and the harmonizing

of their views. Perhaps even more important than that was an attempt to reach the public in some way. There had been a great international congress held in London on tuberculosis, and there was hardly an opinion held by advanced authority on that subject which had not been expressed. Medicine and surgery were in very much closer touch with the public than dentistry, and that closeness of touch was brought about very largely through the daily press, a thing which dentistry as a profession had almost neglected. There was a most woful amount of ignorance on the part of the public as to the possibilities of modern dentistry, and that was because the public was not in close touch with the dental profession and because the dental profession had not done its duty in educating the public in modern dentistry.

Dr. Förberg (Stockholm), as the hour was late, proposed that the subject should be discussed at the meeting to be held next year in Stockholm. He said he had taken the opportunity to give the general secretary the invitation for the Federation to meet in Stockholm, and he was also authorized to extend the invitation to the Executive Committee of the American Dental Society and the dental societies of Europe. Stockholm would do its best to welcome the Federation, but after the grand reception it had received in Cambridge, he was afraid the best would be exceedingly difficult.

Sir Michael Foster said the proposition of *Dr. Förberg* would be considered by the Council.

A vote of thanks was carried with acclamation to *Sir Michael Foster*, and the conference concluded.

After the conference in the afternoon a garden party was held at Merton Hall, at which a demonstration of long-off was given by *Dr. Cunningham*, *Professor Sims Woodhead*, and others, and the interval before the banquet was spent in an exceedingly pleasant manner.

[At the banquet in the evening, given at Downing College, *Sir Michael Foster* again occupied the chair.

There were the usual responses to toasts. These included remarks from *Dr. Brophy*, *Sir Michael Foster*, *Dr. Godon*, *Dr. Harlan*, *Professor Sims Woodhead*, *Dr. Hessé*, *Mr. W. B. Patterson*, *Dr. Häderup*, *Sir James Crichton Browne*, *Dr. George Cunningham*, and *Dr. Sauvez*. From the general tone of the remarks, there was great satisfaction felt at the success of the International Dental Federation, and a cordial feeling manifested for the kindly recep-

tion accorded the visiting delegates. Limited space will not permit the publication of a full report of this banquet.—Ed.]

(To be continued.)

Editorial.

THE FIRST YEAR OF THE NEW CENTURY.

It is always interesting to the casuist to note the effect of certain periods upon the mental and moral forces, whether this be the beginning of a month, a year, or a century, and upon this rather weak foundation a prophecy is based from the periods named for the future. In some respects this certainly rises above mere conjecture and assumes the characteristic of true scientific deduction.

The human mind is liable to sudden changes, both in the individual and in the mass; and while these impulsively run from low to high and in reverse order, there is nevertheless a certain stability, a steady advance towards a higher state. If this were not so, the modern civilization with which we are familiar would have been impossible. This constitutes the hope of the altruist for the future, for to his view the time will surely come when the barbarism of the present, with its savage wars and apologists for brutalities, will have passed away through these positive and uplifting tendencies forcing the human mind eventually to a higher moral standard.

When, therefore, the new era, the beginning of another century, is upon us, the change, while arbitrary, naturally leads to reflection, and that of the first year of the century to a critical comparison with the one hundred years of the preceding century. The history of that period is assured. The work of the wonderful nineteenth century is behind us, and will the twentieth uphold that reputation and pass on to better things? The first year, of which this is the last month, must give some indication of this if existent, and upon this we may draw, in part, the horoscope of the next one hundred years.

This first year has found the world in somewhat of a chaotic condition. Transition periods are always periods of suffering and

discouragement. The civilizations of the world have been on trial, and the ethics of the past have been found wanting. It may be too much to say that there has been no real advancement upon the moral side, but the evidence seems to force to that conclusion. Empires and republics are alike preparing for the eventual conflict which the new century is sure to witness. Until this is over, the reign of peace, which the moral enthusiast longs for, will fail to come. After this, arbitration between nations.

It is impossible, while taking a cursory observation of all the conflicting interests of the world, not to reach a definite conclusion that through all this upheaval there is an undercurrent of pure motives that will eventually attain a higher standard in ethics as inevitably as that the earth and its atmosphere tend more and more to refinement, the physical and moral naturally correlated with each other.

Our interest is not so much with the advance of mind generally, important as that is, but whether the signs visible in the first year of the century portend anything favorable. A year is but a limited time, and yet it means much if in that twelve months even one single advance be made.

The review cannot be confined to individuals. They are but the units of the organization. Upon their health will depend that of the body as a whole; but as these cannot be examined individually, judgment must be formed by a consideration of the mass.

If then, in dentistry, we examine the concrete as represented by the various local, State, and national bodies, we have reason to infer that the individual is growing; in fact, no recent year has done so much in the direction of progress. The national bodies have exhibited much better work in this country during that brief period. The international organizations have brought the labor of the dental world into closer and more harmonious relations. Who could have imagined one year ago that sixteen nationalities could possibly have been brought together in London to discuss a more harmonious arrangement of dental education? Nothing that has occurred this past year of a more encouraging nature than this, even though the final result may not be all that is hoped for. It is the beginning of the destruction of those international jealousies that have done so much to embitter and embroil nations and keep apart members of the same profession. Those who have not read the able and exceedingly clear-sighted address of Sir Michael Fos-

ter before the International Dental Federation, and published in our last number, should not fail to do so. It marks a very advanced step in human as well as professional progress worthy the man and indicative of the new era rapidly approaching.

Who can fail to see in the almost unanimous action of the Association of Faculties, in advancing the course in all the dental colleges to four years, to be another sign of positive growth?

What means the activity of the local organizations, striving with each other as never before to eliminate the crudities of the past and in their place substitute more of real science?

Who cannot see in the active prosecution and the crushing out of the fraudulent diploma establishments a healthy sign that the apathy of the past is over, and that the new year points to a professional body that eventually will be full of vigorous moral health?

While all these outward signs are most encouraging, there seems to be an inward, but not a prominent one, indicative of a tendency to a broad conception of duty and practice. The narrowness—the result of isolation—will doubtless continue; but as the years go by the experiences of this one year will have become fixed as moral and professional facts, and those who live to see it will find the dental profession has risen equal to its high duties and responsibilities, and that the prophetic foundation of the first year of the century has not been laid in vain.

UNITED STATES CONSUL WORMAN AND HIS WORK.

THE following abstract of a letter received from United States Consul James H. Worman will be of interest to all our readers. He says, "I am delighted to report to you this morning (October 30) that the Bavarian ministry has favorably answered our petition to recognize the degrees of reputable American dental colleges. I hope to carry this work successfully with all the states of Germany. This news will be of special interest to you, as it confirms my stand taken before the National Association of Dental Faculties in August, that it is our task to do away with frauds here in order to inspire with confidence in our educational institutions the governments abroad.

(Signed)

"JAMES H. WORMAN."

This acceptance of the diplomas of reputable colleges of the United States by the Bavarian government will unquestionably have a marked influence upon the other states composing the German Empire, but whether they will go as far as Bavaria has gone is doubtful. This state has always been more liberal than some of the others in its recognition of outside educational work.

It is, however, none the less gratifying that this recognition has been accorded, and may it be hoped that this will prove an entering influence that will eventually establish the educational systems of all countries upon a reciprocal basis. The world is fast coming to a period when the narrow distinctions of national boundary lines should be obliterated as far as professional educational attainments are concerned. The diploma from a recognized institution should be a passport everywhere to admit the bearer to active work among all civilized peoples. While the states of this government persist in erecting barriers to practice against the residents of other states, it does not become us to criticise foreign governments for doing the same thing, and thereby protect their people from outside encroachments. When these facts are considered, the liberality of the Bavarian government can be more fully appreciated.

This action must be ascribed to the earnest work of Consul Worman. Those who are familiar with his very exhausting labors in this direction need not to be told that his influence in Bavaria has had largely to do with this decision. His valuable work in exposing the fraudulent colleges in this country has made his name conspicuous both at home and abroad, and it has had a marked influence in governmental circles. The government at Washington has been kept fully informed of his work from the beginning. His writings in this direction have been voluminous, the report of his past summer's work alone covering over two hundred pages.

When it is considered that Consul Worman has neither personal nor professional interest in this labor, that he is spending time, money, and strength simply that American degrees may be purified from all taint of fraud, and be thereby honored for all that they are really worth the world over, it becomes of exceptional interest; and when it is considered that his work has been mainly to cover the dental degree with the mantle of his powerful influence, the members of the dental profession should not hesitate to express in unmistakable terms the appreciation they enter-

tain for his accomplished results, and the unselfish motives that have actuated it from the beginning.

It has been mainly through the evidence furnished by him that the recent prosecutions in Illinois have been so successful, and this will be further continued until the gang of diploma conspirators have been completely routed.

The dentists of Chicago and Illinois seem to have at last awakened to the fact that they have something to do in this direction: it is not much to their credit that this inspiring force had to come through a United States Consul. It seems to an outsider that a little home effort might have accomplished earlier results.

This journal has been sharply criticised in certain quarters for its supposed opposition to this work of the Association of Faculties. This is a misapprehension of the motives of the writer. The earlier work of the Foreign Relations Committee was warmly endorsed, inasmuch as its chairman energetically opened the way to the suppression of the fraudulent diploma business in Chicago; but this having been accomplished, the work should have been left in the hands of the police authorities of that city, as it was not the duty of an educational body to continue that labor. That opinion is still held, and in the writer's judgment the Faculties Association lowers its standard by meddling with the duty of the constituted authorities. While this is true, it does not follow that this body may not aid financially, or in any other way consistent with its position as a leader in educational thought and practice. It was, therefore, proper to raise a certain fund to assist in uprooting this evil, but beyond this it ought not to go. There is a wide difference between this position and that of Consul Worman, or that of individuals, and his work, and that of those who are aiding the authorities of the State of Illinois in bringing these men to the halls of justice to there meet their just deserts, will continue to receive the cordial endorsement of this journal. The Association of Faculties was organized to raise the standard of professional training in all the dental colleges of this country. That it has succeeded in this to a notable degree is known to all; but it must confine its labors within certain well-defined limitations, or it will deteriorate, and its moral influence, heretofore so powerful, will be measurably lost.

The members of the Faculties Association will naturally feel a deep interest in the way the funds ordered through assessment will

be appropriated. They have confidence in the men having this in charge, but some, at least, will not be satisfied if the Foreign Relations Committee undertake to manage the prosecutions as a representative body of the Faculties Association. It would seem eminently proper that this committee should aid Consul Worman to the fullest extent, for it is an injustice to him that he should be forced to spend his private funds in the interest of dentistry of this country. He has already sacrificed a large sum in this direction, and that without hope of reward save the consciousness of duty performed. If he succeeds in destroying the last remnants of this nefarious traffic in diplomas, he will have accomplished more than the police authorities of States and cities have been able to do in the past half century. While he is still energetically at work, let the dental profession of this country give him undivided support and hold him personally in the highest honor.

THE AMERICAN DENTAL SOCIETY OF EUROPE.

UPON another page of this number will be found an earnest appeal to the members of the National Dental Association to change the date of meeting at Niagara next year from August to July. This is desired to accommodate those members of this Association who may propose to attend the annual meeting of the American Dental Society of Europe, to be held at Stockholm in August next.

The readers of this journal are aware that a change from August to an earlier period has been repeatedly advocated. The heated term has always been a detriment to this meeting, and it remains a mystery why the majority persist in making use of August as the meeting month of the year.

If May or early June were selected it would give an opportunity for those who desire to attend the meetings usually held in Europe in August. The climate there is altogether different at this period from that in America. Whether it would be wise to change it this year to accommodate the American Dental Society of Europe remains for the Executive Committee to determine, but it is hoped that the subject of a permanent change may officially be brought up next year either by this committee or the President in his annual address.

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NEW MODES OF THOUGHT BASED UPON THE NEW MATERIALISM AND THE NEW PANTHEISM: Including a Tribute to Edward Drinker Cope. By C. T. Stockwell, Author of "The Evolution of Immortality." James H. West Company, Boston.

Those who had the pleasure of reading Dr. Stockwell's "Evolution of Immortality" will not need to be urged to procure this more recent publication. It is impossible to notice a work of this character in a professional journal as it should be reviewed. It belongs to a range of vision not adapted to the ordinary practical mental activities; but yet even here, to the man or woman who can rise above this dead level and allow the mind to delve into the deeper philosophical thought, this work of Dr. Stockwell will be most welcome.

The reason for this publication is outlined in the following paragraph: "These papers were written with no thought or purpose other than to suggest discussion by the literary club for which they were prepared. Shortly after their first reading, however, they found a larger audience through the columns of the *Springfield Republican*. Almost immediately there sprang up a demand for their publication."

That such a demand was made is not surprising, for it is rare to observe so much valuable thought condensed in an equal compass. So much is this the case, that the reader will find it difficult to select any special chapter or paragraph more worthy of notice than another.

Perhaps what the author denominates as "A Thought Summit" very nearly expresses his dominant thought. "The conclusion seems to be growing that, in the evolutionary forces of all nature, mind, or the mental principle, is the sovereign, the dominant force, rather than the structural, the mechanical, the physical, or even that of inheritance and environment;" and further he writes, "That an organism can in time free itself from its inheritance by choosing or creating or reacting upon its environment, and

thus climb in the scale of being by virtue of its own intrinsic and inherent forces, is now claiming a larger place in the thought of the world than formerly."

The amplification of this view naturally leads up to the consideration of the governing force of the universe. The author discusses the ether problem, and brings to the support of his theories some of the ablest scientists and thinkers that the nineteenth century has produced. He says of this theory, "In the ether, and in the wave-theory of the structure of the atoms, man is beginning to think he can see, with the eye of science, real substance in, at least, its mechanical or physical and mathematical aspect; and in using the word 'substance' nothing else is implied than that which is commonly understood by the terms 'God,' 'Reality,' 'Spirit,' and so forth."

The author, starting with these premises, naturally and inevitably drifts to the consideration of the "over soul" or God; and we therefore find him logically affirming "we must start with God, at the very outset, as the first principle in even the physical and mechanical world. In the physical, in the mechanical, in the 'grossest' material world of phenomena, as well as in the psychical world, we see but different aspects, equally divine, of one and the same thing; and this One is nothing else than God,—God embodied in the ether."

He further says, "Everything is dynamic, animated, 'quick with living powers, burning with intelligence, glowing with passion, throbbing with emotion, crowded with intentions.' This view leaves no room whatever in the whole universe for death or dead matter. Death is dead. It is illusion."

The second part is devoted to "the New Pantheism," but space will not permit following the author through his interesting argument. Whether it will be accepted by all is very doubtful, and to the reviewer it seems questionable whether the human mind is capable, with our present knowledge, of sounding the great depths hidden away in the immensity of the physical universe. Science has only skimmed the surface of things, and, while it is a universal duty to endeavor to solve the mystery of creation, it is a question whether the solution ever will be given to finite intelligence.

The author closes with an appropriate tribute to one of the greatest scientists the nineteenth century produced,—Edward Drinker Cope.

Whatever criticism may be made of this book of Dr. Stockwell, no one can rise from its reading without feeling his mentality invigorated and his spiritual nature strengthened.

Foreign Correspondence.

THE AMERICAN DENTAL SOCIETY OF EUROPE.

2, LONSDALE GARDENS, TUNBRIDGE WELLS,

20th September, 1901.

TO THE EDITOR:

SIR,—The members of the American Dental Society of Europe are desirous that a large number of Americans should visit them at the time of their next meeting, and they are especially anxious to have as many of the honorary members present as possible. It is, therefore, with regret that we learn that the date fixed for the National Dental Association meeting is August 5. We do not wish to take people away from that meeting, and we would gladly change the date of our meeting, making it late enough for you to attend both, if it were possible, but you are doubtless aware that our next meeting is to be held in Stockholm. This is a city of rare beauty and is surrounded by places of interest, which afford opportunity for the most delightful excursions. While easy of access, it has been visited by but few. In short, it is an ideal place for holding a meeting in early August, but *it would not be practicable for a late meeting.*

In addition to the attractions mentioned, we have a most capable and energetic local Committee, which is already at work arranging for the entertainment and comfort of visitors.

Last month at their meeting in London both the International Dental Federation and the Association of Advisory Boards adjourned to meet at the same time and place as the American Dental Society of Europe. This gives our meeting an international character, and distinguished members of our profession from all parts of Europe and America have declared that it is their intention to attend.

In fixing the date of our meeting we must therefore think of the convenience of these bodies.

It is usual for the American Dental Society of Europe to hold its meeting the first week in August, at which time Stockholm is at its best. To defer it to the last of the month would undoubtedly detract from the interest of the meeting and very greatly from the pleasure of those attending. Would it not be to the interest of both societies if the meeting at Niagara Falls were changed to some time in July? Then those wishing to attend could do so, and by taking steamer for Hamburg or Bremen could reach Stockholm in time for the meeting of the American Dental Society of Europe, which, if necessary, could be held a little later than usual in order that they might participate. I am assured that if this could be arranged a large contingent would visit us.

I am, therefore, writing to the President and some of the members of the National Dental Association, asking them if they will change the date of their meeting to some time in July, so that those of their members who wish could also attend our meeting.

Those presenting papers at Stockholm will have the advantage of addressing many of the leading members of the profession, as in an international congress; at the same time they will avoid the crowd of a congress and the danger of being obliged to read a paper that has cost many hours of hard work before a small section.

Yours very truly,

WALDO E. ROYCE,

President.

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